MAN AND HIS WORK

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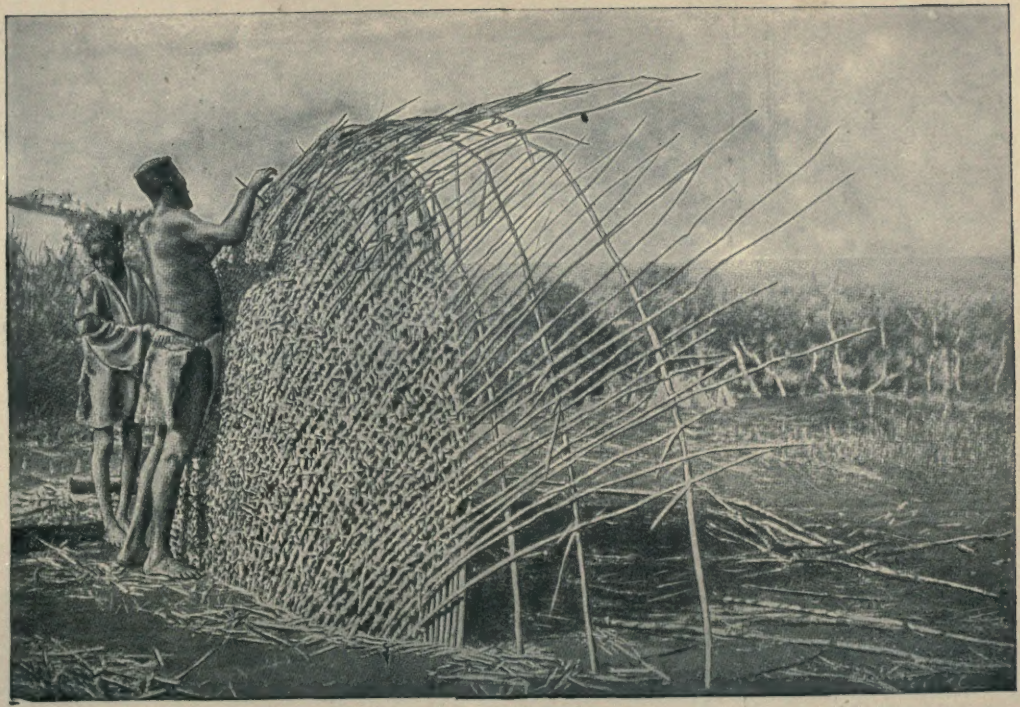
MAN AND HIS WORK



ZULU BUILDING A HUT.
(From *The Essential Kafir*, by Mr. Dudley Kidd.)

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MAN AND HIS WORK

AN INTRODUCTION TO HUMAN GEOGRAPHY

BY

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AND

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PREFACE.

THE present volume, so far as we know, is the first attempt to present in a popular form the principles of human geography. The importance of this branch of geography is so self-evident as to need no demonstration. Without it neither the history of the past nor of our own times can be rightly understood.

The method adopted in *Man and His Work* is as far as possible concrete. Beginning with the simplest societies, in which the effect of physical surroundings is, as it were, "writ large," the increasing complexity introduced by new conditions and occupations is illustrated by concrete examples of existing societies.

In the preparation of the book the writers have made use, wherever possible, of the original narratives of the chief travellers who have visited the regions described. In addition to these, a full list of which will be found in the bibliographies appended to the *Descriptive Geographies of the World*, edited by the present writers, teachers will find Ratzel's *History of Mankind*, an English translation of which can now be obtained, valuable as a storehouse of facts and of suggestions for their interpretation.

The writers desire in particular to record their debt, both for awakening their interest in human geography and for familiarizing them with many of the ideas put forward in the following pages, to Professor Patrick Geddes of Dundee, and through him to the school of Le Play, ably represented at the present time by Mr. Edmond Demolins, Director of *La Science Sociale*. This monthly review contains many articles which cannot fail to be useful to teachers interested in human geography, but considerable discrimination must be exercised in accepting all the conclusions.

The writers gratefully acknowledge the corrections and criticisms they have received.

A. J. H.
F. D. H.

OXFORD, *May*, 1902.

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MAN AND HIS WORK.

INTRODUCTION.

Influence of Natural Conditions on Mankind. The world is the home of man. All that we learn of the physical features of the Earth, its climates, plants, and animals, is of practical importance, because these things have helped to make the human race what it is—here adventurous and progressive, there indolent and backward. A few examples may make this clearer.

For nearly three hundred years, the population of the United States was practically confined to lands east of the Mississippi. During the last half century it has spread over the great central plain, at a rate many times more rapid than during the whole of the three preceding centuries. This is, no doubt, partly due to the improved means of transport, but that is by no means the whole explanation. The difference of climate and rainfall beyond the Mississippi has played a great part in the matter. The settlers in the east found a forested region, which had to be cleared foot by foot before agriculture was possible. The making of a small farm was the work of many years. The pioneers in the west found themselves beyond the forest area, on treeless plains which only required breaking in by the plough. Farms of considerable size could easily be made, and the work of settlement proceeded rapidly.

Again, the natives of Australia, at the time of its discovery by Europeans, were among the most miserable of men. They roamed nearly naked, and were ignorant of everything but the

chase. The explanation of their degraded condition lies in the arid climate of Australia, much of which is almost desert. Vegetation was scarce, and there were no domestic animals. The natives could not improve their position, either by keeping animals or by agriculture. Their great poverty led them to practise vices like cannibalism and the murder of the sick and helpless. The nature of their country is in great part the explanation of the many shocking charges brought against them by early colonists.

Take an example of a different kind. Africa, one of the longest known continents, was, until a few years ago, that of which we had the least complete knowledge. Our maps showed a blank space in the interior, which was quite unknown country. The explanation of this is simple. The country is a high plateau, surrounded by a fringe of swampy and unhealthy coastal plain. The rivers which flow from the interior fall abruptly from the edge of the plateau to the coastal plain, forming rapids and falls. They break up into numerous shallow distributaries, which carry their waters to the ocean across great deltas. Thus they are of little use for penetrating into the interior, until these obstructions are passed. The north of Africa, which had been known for thousands of years, is separated from the interior by the greatest desert in the world, the Sahara. Another desert lies between the European settlements in South Africa and the interior. These are the chief reasons which made Africa "the Dark Continent" for so many centuries.

Climate. No circumstance has a greater influence on the history of different races of men than climate.

The climates of the world are very varied, ranging from that of the frozen north, where plant and animal life practically cease, to that of the hot, moist equatorial regions, where both reach their fullest development. The typical tropical world is one of dense forest and rank luxuriance, where, in the hot reek of decaying vegetation, the germs of fever breed abundantly. Great beasts, such as the hippopotamus and elephant, show the vigour of animal life, while many of the forest trees are veritable giants. Perpetual summer reigns, fruits of gorgeous beauty and attractive scent and taste offer themselves without cultivation, clothing and shelter are hardly needed. In the Brazilian forest, a world of indescribable natural wealth,

we find wandering tribes as backward as the Australian aborigines. These have found life too easy, as the latter have found it too difficult. The climate is enervating, the needs of life are reduced to a minimum, and there is little to stimulate that co-operation for common ends with which social progress begins.

In the Arctic regions it is far different. Abundant food, shelter, and clothing, are necessary to the preservation of life, and the surroundings offer little material for supplying them. The land is buried for the greater part of the year beneath snow and ice. The night lasts for months, uncheered by a ray of sunlight. In the extreme north no scrap of vegetation can be found for fuel, or for fodder for domesticated animals. Houses must be built of ice and snow; weapons must be fashioned from the bones of animals; flesh for food, skins for clothing, and fat for fuel, must all be obtained from the beasts slaughtered in the chase, all of whom ultimately derive their subsistence, not from the land, but from the sea. Life is a constant hand to mouth struggle for bare subsistence. It has developed great ingenuity in the manufacture of hunting weapons, but it leaves no leisure for the satisfaction of any of the higher needs.

Between these extremes the greater part of the inhabited world enjoys a temperate climate. This makes life neither so easy that men degenerate, nor so severe that all their energies are absorbed in the task of keeping body and soul together. The annually returning winter, in which men can neither sow nor reap, but must depend on what they have garnered in summer, teaches foresight and thrift. The recurring spring yearly rewards it and promises another harvest. This combination of caution and thrift with hope and courage is one which never fails to command success. The natives of the tropics, with their eternal summer, lack the caution, and degenerate into improvidence. The natives of the Arctic north have little to arouse hope and courage, and relapse into spiritless and mechanical endurance.

Elevation and Climate. Climate depends only in part on latitude. From the point of view of temperature, 400 feet of elevation are roughly equal to a degree of latitude, and the climate of a country lying well within the temperate zone may be rendered severe by excessive elevation. The same elevation may also isolate it to a greater or less extent, preventing it

from readily obtaining what it lacks, or from disposing of its surplus products. In tropical lands, on the other hand, a similar elevation may be advantageous by rendering the climate of a high region more temperate. Many hill stations in the Himalayas are crowded during the height of the Indian hot season, and the seat of government is transferred from Delhi to Simla, which has an elevation of 7000 feet. Elevation fits many parts of the tropics for permanent white settlement after the difficulties of establishing communication have been overcome.

Distance from the Sea. In the maritime country the sea breezes are relatively cool in summer and warm in winter, tempering the heat of the one, mitigating the cold of the other, and rendering the climate more uniform. In the heart of a great continent the winters are bitterly cold, and the summers intensely hot. Proximity to the sea also brings other advantages, of which the most important is ease of transport. Commodities can be easily obtained from countries across the seas. Fisheries supply an additional source of food. Proximity to the sea is therefore, on the whole, advantageous everywhere, unless harbours are wholly absent, or the seas are icebound for long periods.

Advantages for Settlement. The countries best adapted to support sturdy and prolific races are those lying in middle latitudes, with a moderate elevation, with the sea penetrating deeply into the land, ameliorating the climate, reducing the distance of every part of the interior from the sea, and facilitating the exchange of commodities.

Comparison of the Continents. If we look at a map of the world we see that some continents combine more of these advantages than others.

Europe lies almost wholly in the temperate zone. It is deeply cut by great mid-land seas, which benefit both its climate and its commerce. Its relatively great peninsular area gives it an extended coast line, and reduces the maximum distance from the sea. Its moderate mean elevation, about 1000 feet, is not enough to make its climate severe or to interfere materially with free communication. Most of its great rivers flow across low land for a large part of their course, and are little impeded by falls or rapids. They are thus excellent highways into the interior.

Asia extends farther both to the north and to the south. Its area is greater and more compact, so that the distance from the interior to the coast is much greater. Its climate is therefore much more extreme. Its mean elevation is nearly three times as great as that of Europe, intensifying these extremes. Great mountain barriers impede free transport and intercommunication.

The compactness of Africa is apparent at a glance. The bulk of its land mass lies between the tropics. In temperate latitudes, where the climate is more favourable, the land area is very small. The influence of its plateau configuration has already been noticed.

Australia is another compact land-mass lying partly within and partly close to the tropics. Its position and compactness make it very arid, and much of it is little better than desert.

In the New World, North America obviously possesses many advantages which South America lacks. The bulk of the land is in middle latitudes. Hudson Bay, the Great Lakes and the Gulf of Mexico lie far into the heart of the country. Very little of the land is remote enough from the sea to be actually rainless desert. Great rivers open up the country. The mountains, though lofty, are far to the west, leaving the mass of the country a plain in which communication is easy.

The general shape of South America recalls that of Africa, but the great chain of the Andes presents little resemblance to the plateau configuration of Africa. The bulk of the land lies round the equator, and in temperate latitudes the continent tapers rapidly.

From this comparison we should judge that Europe and North America were likely to be the most civilized and progressive countries of the world. On the whole, the advantage lies with Europe. Sea communication with every part of the Old World is easy, and trade has long been vigorously carried on. North America lies between two "estranging oceans," whose vast extent cannot be covered, even by modern "Atlantic greyhounds," in less than several days. It is only since the growth of steam navigation that a brisk trans-Atlantic and trans-Pacific trade have developed. Now, however, cheap sea transport has brought America to the doors of the Old World, and removed the chief of the disadvantages under which it laboured.

Typical Environments. The world is the home of man, but all parts of it are not equally adapted for his needs. We have to see what various kinds of home it offers men, and how each of these affects its inhabitants.

Vegetation Zones. The contrast, however striking, between polar, temperate and tropical, is too loose to be of much use. Climate depends on much more than latitude, and we cannot group climates according to latitude alone. There is, however, one very suitable mode of grouping. The same conditions of climate, however caused, produce certain characteristic types of vegetation. Broadly speaking, all land is either forest land, grass land, or desert. Each of these leads to the development of special occupations, which exercise the most profound influence on the life of the races engaged in them.

Of forests there are two kinds—temperate and tropical. The former require steady rainfall and moderate heat; the second, torrential rain and great and constant heat. The first are an expression of natural fertility; the second of over-luxuriance passing into rankness. Between the two lie the grass lands, where the rainfall is unsuited for the growth of forest. They are crossed by bands of hot desert, where rain is almost absent.

Deserts are of two kinds—cold and hot, the frozen and the parched. The former are produced by excess of cold, due to high latitude. With these may be included mountain areas above the snow line, where high elevation produces the same effect. The parched deserts are caused by excess of heat and drought, due partly to low latitude, partly to distance from the sea and prevalent dry winds. They are scarcely less destitute of vegetation than the frozen deserts, and on the whole not so well fitted to sustain life.

The following chapters give concrete pictures of human life under these very different conditions. They show, in the first place, how the occupation of different groups of mankind depends on their geographical surroundings, and how these occupations in their turn affect not only the material life, the houses, food, clothing, etc., but also family life, notions of property, progress in trade and manufactures, power of expansion, and ideals of government. All these are classified, not according to race, which is often an accident, but according to those permanent influences by which all races are affected.

CHAPTER I.

LIFE IN THE TUNDRA OR FROZEN DESERT.

The Tundra. Tundra is the name given in Russia to the frozen desert surrounding the Arctic Ocean. In Canada its expressive name is the Barren Lands. It is a belt of dwarf and scanty vegetation, steadily dwindling to the north and disappearing wholly at last, giving place to fields of unbroken ice and snow. To the south stunted copses gradually develop into sparse woods, passing in turn into the forests of north temperate lands.

Climate and Physical Features. The tundra exhibits its least inhospitable aspect in Siberia, where, in the height of its brief summer, it has a peculiar beauty of its own. It is hilly here, flat there, and everywhere broken up by lakes, rivers, and swamps. Buried in winter beneath a sheet of snow, it awakens with the tardy spring to a brief life of great intensity. The sun melts the surface snow, but, even in the height of summer, it is powerless to penetrate more than a few feet or inches into the permanently frozen soil. Whether the surface soil be bog, swamp, or morass, it is but a thin layer, affording nourishment only for those plants whose roots penetrate but a few inches. By the water courses the soil is deeper and sandier, supporting a deeper rooted vegetation. Round these, little groves and copses break the monotony of the tundra. The innumerable lakes are surrounded by green patches of water plants among which ducks and swans make their home. Elsewhere, trees have dwindled to bushes, the commonest being a dwarf birch about three feet high. Stunted berry-bearing bushes, such as the crowberry, cranberry, and whortleberry, grow abundantly, half hidden among the moss which is the characteristic vegetation of the tundra. Tracts of many square miles are covered with bog moss on the lower slopes, and with reindeer moss on the higher grounds, brightened in summer

with flowers of every hue. The Siberian tundra in summer is described by a traveller as diversified by "lichens and mosses of almost every conceivable colour, from the cream coloured reindeer moss to the scarlet cupped trumpet moss, interspersed with a brilliant Alpine flora, gentians, anemones, saxifrages, and hundreds of plants, each a picture in itself."

There are practically but two seasons in the tundra; the long, dreary, silent, almost endless winter; the short, brilliant, summer, with its wealth of flowers, its thousands of mosquitoes, and its innumerable birds. For many weeks in summer the sun only touches the horizon, while for many weeks in winter its disk never rises above it. For two-thirds of the year all vegetable life is hidden beneath the snow, and the only traces of animal life are the footprints of fox or reindeer on its surface.

Animal Life on the Tundra. The tundra is crossed by great rivers, like the Pechora, Ob, Yenesei and Lena in Siberia, and the Mackenzie in Canada. These are ice bound for more than half the year. The ice breaks up in May or June, often producing great floods, due to the fact that the upper waters thaw while the lower courses are still frozen. All teem with fish, which play an important part in the life of the tribes of the tundra.

The only important animal of the tundra proper is the reindeer, which has been well called "the camel of the Arctic desert." It is indifferent to cold, and can make its way swiftly and surely over glacier, morass, or boulder. Its food is the reindeer moss, which it procures in winter by digging with its forefeet in the snow. Only the deepest snow can baffle its search. It has been partly domesticated by the tundra tribes, who allow their herds to roam in semi-freedom, and follow them from feeding ground to feeding ground.

Peoples of the Tundra. The tundra is inhabited by various races, none of them numerous, and of necessity very thinly scattered. The Eskimo, who are found in both the Old and New World, are a coastal people deriving their sustenance wholly from the sea. Scanty Indian tribes are found in the American tundra. In the tundra of the Old World we have Lapps and Finns in Norway and Russia, with Ostyaks beyond the Urals, and many other similar tribes, such as Yuraks, Samoyads, Yakuts, and Tunguses. Many of these are sup-

posed to be of Mongolian origin, but there has been much intermixture, and the problem of classifying them is a very difficult one. What is very certain is that, whatever the race, the geographical conditions under which they live have developed in all a very similar mode of life. What this is, may be best seen on the Siberian tundra.

Occupations of the Tundra. The tundra has little to offer to its inhabitants. Vegetation is of the scantiest, and for two-thirds of the year all trace of it is buried beneath the snow. Reindeer moss affords subsistence for herds of reindeer, and in summer various berries make a scanty but welcome addition to human food. Agriculture is of course impossible in a soil which never thaws more than a foot or two. With the advent of summer, and the melting of the rivers, fish become abundant, but this lasts for little more than a quarter of the year. Fishing, and the hunting of such small animals as find a home on the tundra, are the chief summer occupations, and these must provide, not merely for the summer, but for the dark and dreary winter in store. The drying of fish for winter use is therefore an important part of the women's summer work. The only occupation possible in winter is the hunting of furred animals on the edge of the forests which bound the tundra to the south.

Most of these hunting tribes eke out these scanty resources by keeping a few reindeer, which roam in a semi-wild condition in search of food. The importance of the reindeer, both alive and dead, can hardly be realized. In life, it makes it possible to move freely from one part of the tundra to another. Dead, every portion of its carcase is valuable. The flesh supplies food, the bones and horns are used for implements, the tendons and sinews for thread, and the skins, when made into leather, provide shelter and clothing. Prosperity is measured by the possession of reindeer. To have them is to be a rich man, and a capitalist: to depend on fishing only is to be a poor one, and to live from hand to mouth.

Nomadic Mode of Life. All these occupations involve a nomadic life, that is, one of constant wandering from place to place. Reindeer cannot be kept in captivity, but must be allowed to wander in quest of food. The owners are obliged to follow their herds from one feeding ground to another, in order to obtain their milk for food, and their services for

draught. Hunting and fishing are likewise occupations which necessitate frequent moves, for game would soon be exhausted if they were always carried on over the same area.

The winter is passed under relatively settled conditions, as far as possible in the shelter of the forest on the tundra edge. Here the reindeer can obtain fodder, while the men hunt fur animals in the forests. The Ostyaks go to the forests in October to hunt the smaller fur animals. They return about December. They start again in late winter or early spring to hunt larger game like the stag and elk. Meanwhile, the women and children remain for longer or shorter periods in winter tents near the reindeer, moving after them from time to time as moss becomes scarce in the neighbourhood. The summer finds the whole family on the move for the tundra, where the reindeer are allowed a wider range, and fishing is busily carried on. This occupies the whole energy of the men until the shortening days warn them that it is time to turn their faces southward.

The division of labour between the sexes is that best suited to the mode of life. The men do most of the actual work of procuring food, by hunting and fishing. They also make and mend the necessary weapons. Women's work all the world over consists in making the most economical use of the supplies which men procure. In summer, on the tundra, their task is to clean the fish caught, and to dry any surplus for winter use. Their spare time is occupied in helping the children to collect berries, and in watching that the reindeer do not stray too far to be milked. Another important duty is to strike the tent when it is time to move on, and to pitch it when a halt is made. This work would delay the hunters too long, and therefore would lead to smaller catches. In winter, while the men are hunting in the forests, the women are left in their tents with the children to look after the reindeer, prepare the furs, and make them into clothing and tent coverings.

The Dwelling. The summer life is one of constant wandering, and even in winter it is often necessary to move after the flocks to fresh feeding grounds. A fixed dwelling is therefore out of the question. Instead of that, we find tents, which are easily carried, and can be struck or set up in a very short time. The other possessions of the family are a few indispensable

A LAPP ENCAMPMENT.

weapons, tools and utensils, which must be as light and easily carried as possible.

The summer dwelling, or choom, is a tent, consisting of a framework of poles, with a hole in the top to allow the smoke to escape. It is covered with birch bark or skins—the only materials available. In general appearance it resembles a gipsy tent. In summer it is pitched beside some river or lake. The floor may be covered with a layer of warm dry moss, and is generally littered with rubbish and offal. The furniture consists of reindeer skins for seats and beds, a cooking pot hung from cross poles above a fire made on a large flat stone in the centre, and a few simple utensils.

Such a dwelling is easily moved, and so light that it can be carried by a single reindeer. If wood is abundant, as it is near the edge of the forest, only the coverings are moved, but if the tent poles would be difficult to replace owing to the distance from the forest, they are carefully fastened together and carried by reindeer.

In winter the choom is often used, and is made warmer by adding extra layers of skins. If for any reason a long stay can be made in one place, permanent winter dwellings are sometimes made. These are generally of earth, or, as among the Lapps, of turf, supported on sticks.

Food and Clothing. Food on the tundra consists almost exclusively of the flesh of animals, often raw or decomposed, for there is little squeamishness among people who have so often to go hungry. Blood, either fresh or dried and powdered, is much liked. Reindeer milk is yielded in very small quantities, but as it is very thick and rich, it can be much diluted. The only vegetable food consists of a few edible leaves, like sorrel, and various wild berries. These are sometimes gathered and dried for winter, but in much smaller quantities than the abundant supply would allow. Coffee is obtained by the Lapps, and tea is procured by the Siberian tribes from Russian traders, who also unfortunately sell them large quantities of an intoxicating drink known as vodka, which is frequently drunk to excess. Tobacco is highly prized, and smoked in pipes of native manufacture, often beautifully made and ornamented.

Dress, like food and shelter, is chiefly obtained from the beasts slain in the chase, or from the produce of the herds of reindeer. The skins are prepared by the women, and strongly

and neatly sewn with thread of reindeer sinews. They are often ornamented with bands of coloured cloth where this can be obtained. The dress of both sexes is very similar, consisting of garments loosely shaped to the figure. The cap, or hood, is an important article of dress in the severe winter, and it is also necessary that hands and feet should be well protected. Mittens or fur gloves are worn, generally stitched on to the sleeves, and all travellers have praised and generally adopted the native fur boots. Babies are carried in the mother's hood, or rolled in furs and then laced into cradles which can be carried on the mother's back.

Weapons and other Implements. The most important utensils are those connected with transport and the chase. The sledge is universally found, drawn either by dogs or reindeer. It is a rough platform supported on runners. The Lapps and Samoyads use ski. Among the Lapps these are made of fir wood, twelve to fifteen feet long and four or five inches wide, pointed at both ends. The foot is thrust through a loop in the centre. On ski natives can travel 14 or 15 miles an hour over good snow. All travelling, whether on sledge or ski, is easier in winter than in summer, when the tundra is water-logged and swampy. Bows and arrows are used in the chase, but firearms are spreading, especially among the Lapps. Blunt arrows are used in hunting fur animals to avoid injuring the skin; and among other implements are lassoes, axes of stone and iron, borers, scrapers, and knives. The Samoyads have calculating sticks, covered with notches, with which they reckon rather skilfully.

Family Life. Family life is greatly affected by the manner in which these tribes are forced to live. It is wanting in all those higher qualities which grow up with a settled home and a reasonable security of existence. Marriage is an exchange of services, and like other bargains is settled by payment. The chief impediment to polygamy is that most men are too poor to buy and maintain more than one wife. Where the expense can be afforded, there is no other objection. Marriages take place early. Children are kindly treated. As among all races where subsistence is precarious, and the life nomadic, there is little pity for those who cannot support themselves, and the aged and sick, and weakly or superfluous children, are often left to perish.

The Eskimo. The Eskimo, the most northerly people of the world, living on the borders of the frozen sea beyond the limit of the tundra, are a nation of fishers. Like all other hunting tribes, they are nomadic. At the approach of their long winter they halt and construct an igloo, or permanent winter dwelling of ice and snow. With the return of summer they move on again, erecting skin tents. Their clothing is made of furs and bird skins, their implements of bone, with any drift wood attainable. Their food is exclusively animal, and very largely composed of fat, or blubber, which is also used for fuel.

The characteristic Eskimo implements are the kayak, the light, portable, almost indestructible canoe, and the harpoon, a weapon intended for hurling from the kayak. The Eskimo is an extraordinarily expert seaman, and can easily right his light craft if overturned. His ingenuity is shown by his use of the inflated bladders of slain animals to tow the animals he catches. His harpoons, bows, and arrows, are all made with great nicety, and his drawings show considerable artistic skill.

The tundra, therefore, and the icy regions beyond, admit of no occupations but hunting and fishing, together with a little trade in furs. The mode of life is nomadic, and the family ties are weak. The scanty resources at command only furnish a bare subsistence, and give no margin for the accumulation of wealth, or leisure for the improvement of the arts of life.

CHAPTER II.

LIFE IN THE TEMPERATE FORESTS.

The Influence of Climate on Temperate Forests. The growth of temperate forests depends first on a fairly abundant and regularly distributed rainfall, and secondly on a suitable summer temperature. Forest trees cannot survive where the summer temperature is less than 50° F. The line separating forest and tundra does not therefore follow any parallel of latitude, as many conditions besides latitude affect the summer temperature. In Alaska and the Mackenzie basin, the forest extends 300 miles north of the Arctic circle; in East Canada it ends 500 miles south of it, owing to the reduction of the summer temperature by the great frozen area of Hudson Bay. It rises again in Norway and Lapland, but falls again in the neighbourhood of the frozen White Sea. North of the forest line the trees become stunted bushes, but their size and the number of species increases rapidly as the dividing line is reached.

Distribution of Temperate Forests. At the present time virgin forests cover a great part of North America, the highlands of Scandinavia, and a great part of Siberia south of the tundra.

Central Europe was once forested. Only small patches now remain, chiefly on the highlands, such as the Black Forest (Schwarzwald) in Germany. The plains have been almost entirely cleared.

In the latitudes of the southern hemisphere, where the climate and rainfall would be suitable for the growth of temperate forests, the continents taper and there are no large forest areas, though the highlands are well wooded.

Forest Trees. Temperate forests are mainly composed of conifers on the highlands or in high latitudes. and of deciduous trees on the lowlands and in low latitudes.

The forests of Europe, now confined to the highlands and

high latitudes, are chiefly of fir and pine. The Forest of Dean, in Gloucestershire, is one of the few surviving patches of the deciduous forest which once covered Southern Britain, and supplied oak for "the wooden walls of England."

Forest Fires. The forest regions of North America and Siberia are constantly being partly destroyed by forest fires, caused by lightning in dry seasons, when the resinous timber is very inflammable. Hundreds of square miles may be cleared in a few days. After the first desolation is past the forest puts forth a new growth, thus renewing its youth and vigour. At first the deciduous trees have the start, but at the end of a few score years these are showing signs of age, while the conifers are reaching their prime.

Occupations in the Temperate Forests. It is not possible to take a single typical example of life as it is lived in the zone of north temperate forests. The forests of Europe have for the most part been cleared, and the clearings are occupied by agricultural races, at various stages of progress. Their life differs greatly from that possible in uncleared forests, and assumes forms too numerous to describe in detail. The same thing is rapidly happening in the United States and Southern Canada, where clearing has been proceeding steadily during the last four centuries.

Occupations in the Uncleared Forest. The uncleared temperate forests remain chiefly in Canada and Siberia.

The only occupations possible in these uncleared forests are those which utilize the raw materials of the forest—its animal life and its timber. The animals, more especially in the far north, are clothed in thick furs, which are often of great beauty and commercial value. Timber is required for building, joinery, and many other purposes, and is in great demand.

In the Siberian forest fur hunting is much more important than the trade in timber at the present time. These forests are the greatest fur hunting grounds in the world. They do not appear to be inhabited except on their fringes. Ostyak and Samoyad hunters penetrate a few miles into their gloomy depths, leaving their families on the edge. Their life differs little from that described in the preceding section. Their only exchangeable wealth consists of furs, which they barter to traders who periodically visit their settlements.

In Canada fur hunting is actively carried on by trappers,

PINE FOREST WITH LOGS BEING FLOATED DOWN.

many of whom are Indians or half-breeds. Fishing is also important. Canada is a land of rivers and lakes. The fish with which they teem supply food for those engaged in forest occupations, and are preserved and exported. Lumbering, as the trade in timber is called, is carried on by backwoodsmen. During winter, when transport is easy over the frozen surface of the snow, the logs are dragged to the creeks, to be floated in spring down the excellent natural waterways. Many of these backwoodsmen are of mixed blood and retain the nomadic habits of their Indian ancestors. The majority of lumbermen of European descent go to the forest only in winter and return in summer to their homes in the settled country.

Various other industries arise out of the Canadian lumber trade. The same water power which floats the lumber down from the forests of the interior is also employed to turn saw-mills. Much timber is converted into wood-pulp at the cities situated on the great lakes. This wood-pulp is used for paper-making and other purposes, and paper mills are therefore also found in the lake cities. Formerly much shipbuilding was carried on in the ports of New Brunswick and Nova Scotia, which possessed two advantages. The first was their maritime position, for ships cannot be built inland. The second was the neighbourhood of great forests, which supplied timber at small cost. Many of these towns have declined in prosperity since the increased use of iron vessels.

Occupations in the Forest Clearings.—Scandinavia. In the parts of Europe and North America, which have been cleared for agriculture, the occupations are much more varied. The simplest mode of life is perhaps that to be found in Scandinavia.

In Scandinavia, owing to the influence of the Gulf Stream drift, the forests extend far to the north. In the extreme north the trees become stunted, and the ground is carpeted with reindeer moss. Many parts of Sweden are rendered quite inaccessible by swamps, and are the home of moose, which are hunted for a few weeks in the season. In the extreme north, where the forest is passing into tundra, the inhabitants are of Lapp blood, and wander from place to place depending on their reindeer for existence. They practise a little agriculture, but their crops often fail. Then birch-bark flour and reindeer moss are both used for human food.

FLOATING LOGS INTO MILL.

SHIPPING WOOD PULP.

WOOD PULP INDUSTRY.

(From photographs kindly lent by United Newspapers, Ltd.)

In the forest proper the industries of Scandinavia resemble those of Canada. In summer timber is floated down to the coast, and the saw-mills are busy. Ship and boat-building are largely carried on, for every coast family has a boat, and the Scandinavians, and particularly the Norwegians, are a nation of sailors. Tar is made from the roots of trees which have been felled for other purposes, and is floated down in barrels placed on rough rafts. The Swedish matches, sold so cheaply in this country, are made by peasants in the Swedish forests.

Where the climate is too severe for agriculture to succeed well, fishing is an important means of eking out a living. Every year the men depart in large numbers to the Loffoden and other fishing grounds, to engage in cod and other fisheries. Others go to the more distant whale and seal fisheries, or engage as hands on trade or coasting vessels. The women and children remain at home, and they carry on the farm work. The farms are generally by lakes or rivers, where the soil is better and fish are plentiful.

Agricultural clearings are steadily encroaching on the forest wherever the summer temperature will ripen the crops. The long days, almost nightless towards the Arctic circle, promote an extraordinarily rapid growth of vegetation, but the lateness of spring often prevents crops ripening before the early frosts. Wheat ripens within the Arctic circle in Norway, but not in Sweden, where the influence of the Gulf stream drift is little felt. Beets, flax, hemp, and turnips grow as high as Vardö, hops ripen as far as Loffoden, many cultivated berries do well as far as 70° N., but cherries are not found farther north than 66° N. An unusually late spring has a very marked effect on the ripening of all these.

The life of many Scandinavian farmers is simple and primitive, and there is much less division of labour than in the more advanced agricultural conditions with which we are familiar. Many of them are very clever at various handicrafts which their comparative isolation compels them to practise. A man wishing to build or enlarge a house cuts his own timber, and is his own carpenter and joiner. He is often tanner, harness-maker, shoemaker—working up the hides of his cattle for home use — blacksmith, miller, boatbuilder, and fisherman. The women attend to dairy farming, preserving fish and meat for winter, spinning, weaving, and other industries connected with

food and clothing. Class distinctions are almost unknown, and mistress and servants work together on a footing of equality.

In the towns, which are comparatively few, the occupations are wholesale and retail trade, various manufactures, education, law, medicine, and other professions with which we are familiar in our own towns and cities.

Dwellings, Food, and Clothing. In all forest regions wood supplies the most suitable material for constructing dwellings. These are of many types, from the rude log hut of the backwoodsman to the elegant châlet of the Swiss valleys, and the even more picturesque peasant houses of the Black Forest. In the uncleared forests fish and game, and in the cleared forests various kinds of agricultural produce, form an important part of diet. Furs are naturally employed for clothing, especially in remoter forests, but the rapid development of trade is distributing manufactured goods over almost the whole world.

Agriculture and Progress. The occupations and mode of life possible in the forest are thus much less simple and uniform than on the tundra. This is largely due to the possibility of clearing for agriculture, which substitutes a permanent for a precarious source of subsistence, renders a settled home possible, and creates an income more than sufficient to supply the needs of the individual family. Hence each generation, unless incapable or improvident, starts a little better equipped than the last. The hunter's whole time is consumed in wandering far and wide in the quest of daily food; with agriculture and the accumulation of a surplus comes leisure for progress in domestic and mechanical arts. The need for ploughing and tilling, for harvesting and garnering, stimulate, while abundantly rewarding, ingenuity. Hence the development of agriculture is everywhere marked by an advance in material arts, as well as in such moral qualities as industry and thrift.

CHAPTER III.

LIFE IN THE STEPPES.

The Grass Lands. At a great distance from the sea, as, for example, in the heart of a vast continent like Asia or North America, the rainfall diminishes until it is no longer sufficient to nourish forest trees, and grass becomes the characteristic form of vegetation. These treeless lands are known by various names. In Asia, they are called steppes; in North America, prairies; and in South America, savanas, campos, llanos, and pampa.

Steppes and Savanas. Two distinct sets of climatic conditions produce these grass lands, leading us to distinguish between steppes and savanas.

Steppes. Steppe is a Russian word denoting "unwooded tracts in middle latitudes, of considerable extent, and covered with useful vegetation." It is a convenient term to describe those lands whose treelessness is due to great extremes of climate, produced by their remoteness from the ocean. The ground which has been frozen in winter, thaws in spring, and the soaking soil is exposed to the rays of a scorching sun. The season of growth is short but intense. Those plants do best which most quickly reach maturity. These are not the forest trees, for deciduous trees mature slowly, and conifers still more so. The victory belongs to the grasses, which grow with incredible rapidity, and in a few weeks attain the height of a man. Wind-borne seeds of forest trees do, indeed, often pierce the soil before a blade of grass is in sight; but before they are more than an inch or two in height, they are suffocated by the sea of grass, which shuts them out from light and air, and leaves them to perish. The scorching summer sun and early autumn frosts destroy the year's crop of grass, but its seeds, already ripened, fall into the soil to germinate in the following spring.

Distribution of Steppes. The steppes include the grass

lands of the Central Asian plateau, which stretch from Manchuria across Mongolia, Turkestan, Southern Siberia, and South Russia into Hungary, and include a great part of the plateaus of Persia, Asia Minor, and Arabia; the prairies of North America, stretching west of 100° W., and rising to the eastern slopes of the Rocky Mountains; and the grass lands of Patagonia in South America. As the rainfall diminishes, all of these become more and more arid, passing at last into true desert.

Savanas. Savanas are caused by an approximation to tropical conditions. They are a link between the rainless deserts, into which the steppes gradually pass, and the tropical forests which receive torrential equatorial rains. There are two seasons only—a long dry season of drought and death, and a shorter wet one of rain and life. Plants must be able to complete the cycle of germination, growth, and the ripening of their seeds before these processes are arrested by the return of the dry season, in which growth is practically impossible. Here again grass succeeds best; and the savanas, like the stepppes, belong to the grass lands of the world.

Distribution of Savanas. Savanas occur in continents lying between the tropics, that is, in South America, Africa, South Asia, and Australia. In Africa they are found north and south of the equator; they include the llanos of Venezuela, the campos of Brazil and the pampa of South America; the park lands of Africa; and the downs of Australia.

The Old World Steppes. The steppes of the Old World are of peculiar interest, not only on account of their vast extent, but because they have preserved almost unchanged for five thousand years the mode of life described in the Hebrew Scriptures. Long after the New World grass lands have been transformed by European enterprise, it seems possible that the remoteness and vast extent of the Asiatic steppes will retard the change from ancient to modern conditions.

Descriptions of Steppe Scenery in Holy Scripture. The earliest description of steppe scenery is found in scattered phrases of Holy Scripture, which acquire a new meaning when this is realized. The desire of the Shepherd King for "green pastures and still waters" represents the ideal of well-being in a steppe land, where water is often so scarce that man and beast are parched with thirst, and the grass withers in the scorching

sun. The thought of "the shadow of a great rock in a weary land" is nowhere so comforting as where the dry steppe is passing into the rainless desert, as on the borders of Palestine. The familiar phrase, "the desert shall blossom as the rose," is a literal description of a spring landscape on the steppe; "the grass withereth and the flower fadeth" describes the same scene in autumn. Many modern travellers have remarked the accuracy of such descriptions of steppe scenery, many of which will readily suggest themselves to the memory.

Physical Features of the Asiatic Steppes. The Asiatic steppes, an area far greater than the whole of Europe, offer a great variety of surface, but may be described broadly as undulating plains, with occasional highlands, well wooded towards the forest limit, and becoming more and more arid as the comparative rainlessness of the true steppe passes into the drought of the desert. The scenery is monotonous in the sameness of its immensity, and the salt steppes, formed by the evaporation of former lakes existing at a period when the rainfall was greater, are veritable types of desolation. Many river beds are stony, waterless channels for many months of the year, but where they contain water, they are generally bordered with willows, poplars, and birches, breaking the uniformity of the sea of grass.

The spring is the season of beauty in the steppe. The German traveller, Brehm, one of the best of observers, as well as a true poet and naturalist, thus describes the wonderful scene: "Boundless tracts are resplendent with tulips, yellow, dark-red, white, white-and-red. Immediately after the tulips come the lilies. More gregarious and richer in species, they appear in much more impressive multitudes, and completely dominate wide stretches of country. Usually each species, or variety, is by itself, but here and there blue lilies and yellow are gaily intermingled—a vision for rapture. After a few weeks, the steppe land lies like a gay carpet. . . . The dwarf almond, alone or in association with the pea tree and the honeysuckle, covers broad stretches of land in all its glory. . . . The whole effect is a shimmer of peach-red, in lively contrast to the green of the grass and herbage, to the bloom of the pea trees, and even to the delicate rose-red or reddish-white of the woodbine."

The summer finds the steppe green, but its scorching sun soon turns it to brown. Autumn sees a grey, yellow landscape.

The first storms lay low the brittle stems, and the early frosts cover the lakes and streams with ice, and powder the uplands with snow. Winter brings the fierce buran, or snow-hurricane, from the north, often fatal to man and beast. The snow disappears from the valleys about April. The soil is abundantly moistened by the thaw, and sun and water, like two magicians, soon cover the land with a carpet of grass and flowers.

Animals of the Steppe. The animals of the steppe are grass-eating, or herbivorous, and include many of those most useful to man. Many have been domesticated, *e.g.* the sheep, goat, cattle, camel, ass, and horse.

Inhabitants of the Asiatic Steppes. The chief tribe of the Russian or western steppes is the so-called Kirghiz. This name is an uncomplimentary one, meaning freebooters. They call themselves Kazák or horsemen, which is the same word as Cossack. The Mongols inhabit the steppes east of the Tian-shan. The mode of life is everywhere almost identical.

Occupations of the Steppe. The domestication and breeding of animals is the only occupation for which the steppe is perfectly suitable. On its edges the rainfall is sufficient for cultivation, and this area might be increased, as it doubtless will be, by irrigation, but much of it will always remain pasture land, as it has been from time immemorial.

Importance of Flocks and Herds. The vast area of the steppes isolates the inhabitants from the settled agricultural country, and compels them to depend wholly on the produce of their flocks and herds. But the steppe dwellers feel no envy for a life which cannot be theirs. They despise agriculture and the comforts and luxuries of a more advanced civilization. Their flocks and herds yield enough for all their needs. The wool of the sheep is made into felt for tent coverings, and camel's-hair cloth, such as the Baptist wore, is also manufactured. Leather and hides are abundant, and provide shelter and raiment, as well as bottles and other utensils. Rich rugs and carpets, whose beauty is proverbial, are also made from wool and hair, for the materials are abundant, and they are useful, easily portable, and valuable as articles of exchange. Milk and flesh suffice for food, and the rich manage to procure flour and rice from trading caravans. Horse flesh is a dainty greater even than the fatted calf, mutton is highly esteemed, whilst beef is regarded as the poorest food. In summer, milk

is the staple food, and animals are rarely slaughtered. Much of the milk is fermented into the famous koomiss, of which large quantities are drunk, and some is made into butter and cheese.

The whole well-being, therefore, of the steppe dwellers depends on that of the flocks, which supply shelter, food, and raiment. Consequently, the whole life is organized to secure the best conditions for their domesticated animals.

Nomadic Mode of Life. The first thing we notice is that steppe life must be one of constant wandering from place to place. The flocks are continually eating up the grass, though the skilful shepherd knows how to make it last as long as possible. First he sends the horses into the long grass, then these are driven a little farther, and their place is taken by oxen and camels. When these can no longer manage to find food, the sheep are turned in, and for a while find abundant pasture on the short nibbled grass. But a day comes at length when even the sheep can no longer find food, and then all must move on.

The wandering life begins in April or May and lasts all the summer. The tent is struck and pitched continually, sometimes daily. When a move is made, the horses go first under the charge of a special herdsman, followed by the other animals in flocks. After all are away, the women strike the tents, pack the rugs and carpets, the leather bottles, the few utensils, and load the camels and oxen. Then they mount their horses—for every steppe-dweller is a perfect horseman—and follow. At middle day the flocks are milked into leather bottles. Then all move on slowly, the animals perpetually browsing, till sundown. A halt is made, the tents pitched, and the evening meal taken after the flocks have again been milked. Sometimes, if the pastures are poor, the march is resumed next day, but if they are rich, days or weeks may be spent on one spot, the beasts being driven in different directions by mounted horsemen till all the grass in the neighbourhood is exhausted. As the summer advances the plains become too hot, and the swarms of insects inflict serious damage. Then a move is made towards the higher part of the steppes, for the wanderings of these nomad shepherds are not hap-hazard. Water is essential, and the direction is determined to a large extent by the distribution of wells and springs. Young men ride on

ahead to clear out the wells, and otherwise determine if a spot is suitable for a halt. At the approach of winter, a return is made to the lower lands, and ultimately to the winter quarters, which are usually the same from year to year.

The movements of each group depend on those of similar groups. Each group has traditional rights of pasturage over different parts of the steppe, and these cannot be transgressed without leading to hostilities.

The Summer Dwelling. The wandering summer life evidently necessitates the use of a dwelling which can readily be moved from place to place—in fact, a tent. The winter is passed either in a fixed dwelling or in tents.

The yurt, the summer dwelling, is the most perfect of tents. Though admirably adapted to the life, it affords a high degree of comfort. In this it differs materially from the miserable shelters of the tundra nomads and other hunting tribes. Its materials are durable and valuable, and form part of the capital of the steppe dweller. Its framework is an expanding lattice work, which can be made larger or smaller at will. This lattice work is secured by a coupling ring at the top, with holes in which spars are inserted forming a pointed roof. A morticed opening in the lattice work forms a door. This framework is covered with large sheets of felt held together by cords and bands.

Such a tent can easily be put up or taken down by the women in half an hour; it is so portable that it can be carried by a single camel; it is readily closed in a storm or opened in sunshine; it is easily adapted to the required size, and it is comfortable, commodious, and durable. The interior is furnished with rugs, cushions, and carpets, all forming part of the wealth of the family, and among the rich these are of great beauty and value. The wandering life limits the quantity and nature of the household utensils. Everything must be easily portable, and as indestructible as possible. Thus, bags, etc., are made of leather, first, because it is the most available material, and secondly, because more fragile articles would not stand the constant moving.

The Winter Dwelling. The winter dwelling, when fixed, is generally made with walls of plaited willows, or bundles of reeds, both of which are easily obtained about the watercourses. The roof is of reed thatch. Animal dung, dried in the

previous spring, is used as fuel. Such a dwelling is musty, damp and dark, and the yurt is often preferred. Stables are erected for the tender, young animals, and shelter for the flocks.

The proper choice of winter quarters is very important. Water must be readily obtainable, and this greatly limits the choice. The grass in the neighbourhood must have been spared, and hay collected from grass mown at a distance. In good winters, when there is but little snow, the inclement months may pass well enough, but in a hard and snowy winter the herds are greatly reduced, bringing poverty and privation on the owners.

Importance of the Horse. The flocks and herds of the steppe shepherds are often of vast size. The wealthy possess hundreds of camels, thousands of horses, and tens of thousands of sheep. Of these the horses are the most prized, and a man's wealth is measured by the number he owns. The Kirghiz proudly call themselves The Horsemen (Kazák). Without their swift steeds it would be impossible for the herdsmen either to ride ahead and choose suitable halting places, or to keep the vast flocks from straying beyond reach. How much this means will be seen if we remember that some of the droves move much more quickly than others, and that a moving aul, or group of pastoral families, may cover several miles. Similarly, horses make the constant migration much easier for the women and children. It is natural, therefore, that these nomadic tribes should be horsemen almost from the cradle. Children are mounted at four years of age. They quickly become fearless riders, and soon learn to make themselves useful as mounted shepherds, keeping the droves from straying at will from the line of march.

Influence of the Occupation on the Family. The great size of the flocks not merely makes the nomads a race of horsemen, but it has a marked influence on the family life. To tend thousands of head of cattle, and to water and milk the flocks, many persons are needed. The larger the household, the more numerous the sons and daughters and servants, the more can the flocks and herds of a family be increased. On the other hand, if a family is poor in numbers, it must be content to part with its surplus animals. So, from Biblical times onwards, we find the head of the family, when sufficiently rich,

SHEPHERDS ON THE STEPPES OF HUNGARY. *Erdelyi, Photo.*

is the husband of more than one wife, the father of many children, and the master of numerous servants, many of them connected with him by blood. For the same reason the grown-up sons, when married, still remain by the father, and thus a large group grows up all related in blood. In such a society great pride of descent is felt, and long pedigrees are carefully remembered. The head of the family is absolute, and his word is law. The same reverence extends to the dead ancestors, who are often commemorated by the living.

Character of the Steppe Dwellers. The occupation and mode of life have developed characteristic qualities in the children of the steppes. Obtaining everything from their herds, and depending for nothing on outside supplies, they are proud and independent, despising settled life, agriculture and commerce. No modern improvements are introduced into an occupation like shepherding, which is the same now as in the time of Abraham. Hence, they are conservative, opposed to innovation and attached to tradition, that is, highly unprogressive from the point of view of a different mode of life. They are often reduced from wealth to poverty by unavoidable disasters, such as pestilence among the flocks, an unusually long and severe winter, prolonged drought, or sudden tempest. Their powerlessness to avert such calamities makes them fatalists, a characteristic so common among Orientals. Finally, the common relationship among members of the same group develops into a sense of brotherhood, and is doubtless the origin of the hospitality so readily shown to strangers.

The influence of the geographical conditions under which they live, thus modifies their occupation, their mode of life, and their habits of thought. Like the tundra tribes, they are wanderers, but of a far higher type. The more generous environment allows them to amass wealth, to supply the needs of the present, and to provide for the future. Thus, they are able to multiply freely, and infanticide and inhumanity to sick or aged are unknown, for these are the vices of nomadic life only when the means of subsistence are scanty and precarious.

The African Savanas. The Savanas of tropical Africa extend over the interior from the Sahara to the Karroo, except where torrential rains occur and produce the virgin forests or wet jungles. They are for the most part level grass lands, intersected with water courses bordered with mimosas,

baobabs, and palms. The fauna includes antelopes, buffaloes, zebras, elephants, rhinoceroses, giraffes, and great cats, such as the lion. Numerous tribes, *e.g.* the Masai, lead a pastoral life, usually combined with rudimentary agriculture. In South Africa the grass lands are occupied by the pastoral Boers, of Dutch descent, who formed patriarchal households among the native races, giving rise to a large half-breed population. They possess many of the qualities of the Asiatic steppe dwellers, but are at a less primitive stage of development. At the same time they feel the characteristic contempt of the herdsman for mercantile pursuits, and have left their vast mineral wealth to be exploited by outlanders. On these miners and traders they look down, and refuse them the rights of citizenship.

The American Grass Lands. The steppes of North America have been occupied, chiefly in the last half century, by settlers of North European descent, who have established large cattle-ranches. These have not reverted to pastoral habits in returning to pastoral life. This is partly because they came of a race which had acquired different characteristics during centuries of settled life, and partly because the construction of railways has opened markets and removed the isolation of steppe life, where nothing could be procured from outside sources, and each group had to supply its needs from the materials at command. The nomadic life on these ranches is left to the "cowboys," mounted herdsmen like the Kirghiz. These are often half-breeds, descended from nomadic Indians, to whom such a mode of life is natural.

The Savana lands of South America will in the future become more valuable than at present. Much of them is suitable for cultivation, and most sub-tropical and many temperate plants would grow well. The population is scanty, though immigration is increasing, and much of their vast extent supports only thinly scattered tribes of Indians.

The Australian Downs. The grass lands of Australia, or downs, lie immediately west of the eastern mountains and near the west coast. Large sheep-runs have been formed by colonists, chiefly British, who retain the habits of settled life, and employ native stockmen. Facilities exist for exchanging the produce of the flocks—wool, hides, tallow, meat—for the commodities of civilized life, and the life resembles that of the American prairies, rather than that of the Asiatic steppes.

CHAPTER IV.

LIFE IN THE HOT DESERTS.

Distribution of Deserts. A belt of hot, rainless deserts is found round the tropics, wherever these cross large land masses, and in the heart of Asia. In the Old World the deserts of the northern hemisphere stretch almost continuously from Mongolia to the African shores of the Atlantic. This belt, known as the desert of Gobi in East Asia, and as the Takla Makan in Chinese Turkestan, is continued through the deserts round the shores of the Caspian and Aral Seas, across Arabia, and through North Africa under the name of the Sahara. The Sahara is the largest desert in the world, equal in area to the whole of Europe. In North America are the deserts of Arizona, New Mexico, and Mexico. The corresponding deserts of the southern hemisphere are the Atacama desert in South America, the Kalahari desert in South Africa, and the great Australian desert, the largest in the world after the Sahara.

Cause of Deserts. The cause of deserts is rainlessness, due either to the fact that the desert lands are continental regions lying in the track of the trade winds, which become too hot and dry in passing over the heated land to deposit rain; or else to the fact that, like the desert of Gobi and the north Chilian desert, they are shut in by lofty mounntains which intercept the moisture of the rain-bringing winds.

The deserts of the world, differing greatly in superficial features, agree in this common feature of rainlessness, with its corresponding absence of vegetation.

The Sahara. The Sahara may be taken as a typical desert, though it presents a great variety of surface; of rocky and sandy soil; and of relief, including mountain ranges, plateau and plain. In Tunis it is a plateau carved into fantastic forms resembling ruined masonry; in the Libyan desert it is a sandy

plain; and farther west a rocky waste. The characteristic sandy soil is caused by the enormous and sudden ranges of temperature, not merely between season and season, but more particularly between day and night. The rocks are continually expanding and contracting rapidly, and so are quickly broken up and reduced to sand. This is blown by the wind into sand hills or dunes, and at times the dreaded simoon or sand storm rages, darkening the air with whirling sand, and overwhelming both man and beast.

Oases. The absence of vegetation is due wholly to the lack of rain—which in many parts of the Sahara falls but once in five years—and not to natural infertility of soil. On the contrary, wherever water is obtainable, the soil is of exceptional fertility as the mineral constituents have not been washed out of it. Fertile spots, known as oases, are found around the natural wells; along the banks of the rivers and also of wadis, or water courses, which, however, are but occasionally filled with running water; and round the artesian wells which have recently been sunk in the south of Algeria. Along the Nile lies the rich agricultural land of Egypt, which owes its fertility to the annual overflow of that great river.

Scenery of the Sahara. The absence of vegetation makes the scenery monotonous. The beauty of the desert is chiefly that of colour. The sky is deep blue and cloudless, the air extraordinarily clear, the orange sand lustrous in the blazing sunlight. A traveller in the Libyan desert writes "At the solemn majesty of the wilderness every sound is hushed; over the boundless yellow surface broods a shimmering refracting atmosphere heated by the mid-day sun, against whose impressive glare the eye in vain seeks relief in some shady nook. More vividly even than the sea, the solitude produces the impression of limitless space, its very grandeur stimulating to reverie, and awakening feelings of awe and devotion." By moonlight the scene is one of weird beauty.

Vegetation. The vegetation of the Sahara is divided into true desert vegetation, and oasis vegetation. The desert plants are tamarisks, prickly acacias, thorny plants and shrubs, and coarse grasses. The oases produce the invaluable date palm, a variety of fruits, and cereals, *e.g.* rice and millet. The same traveller thus describes a Libyan oasis, "Now a land of roses, of the vine, olive, sugar cane, and cotton, where the orange and

lemon plants attain the size of our apple trees, it was in primeval times an arid depression of the stony and sandy Libyan waste. Then came an early Pharaoh, who cut a deep channel through the rocky barrier towards the Nile, and thus let in the western arm of the river."

Animal Life. The camel, though not a native, has become the characteristic animal of the Sahara. Sheep, cattle, and goats can only be kept on oases, or on the fringes of the desert.

Population. The dwellers of the Sahara are of very mixed blood, in which Arab and Berber predominate. The Tuareg and Tibu are the principal tribes of the Sahara proper. A negro type is found on many of the oases. The population is partly settled, partly nomadic.

Occupations of the Settled Population. Settled life is possible only where water exists. A large population is crowded into the oases round the springs and wells. The settled population is engaged in agriculture, the keeping of domestic animals, and trade, or in a combination of all. In the Nubian desert the sedentary population outnumbers the nomads, but cultivation is a matter of great difficulty. There is often only a little creek filled with fertile mud, or perhaps only a scanty deposit of mud on a rock which must be reached by swimming. Sometimes a water wheel can be erected and irrigation resorted to; this is prosperity. On the oases the cultivation of fruit and cereals is often very successful.

Trading Villages. On the larger oases spring up trading villages, through which all caravans pass. The aspect of these is often far from prosperous. The houses are rude huts of stone or clay, windowless and dismal. The only timber is from the date palm. A ring of palm leaf huts serves for the poorer and servile class. A school and mosque may also frequently be found. The trade is chiefly in dates and salt, and camel hiring. On the largest oases, *e.g.* that of Tafilet, many industries are carried on. Dates are dried, goat skins made into leather, pottery manufactured, blankets and carpets woven, and various domestic arts practised. On the Mediterranean coast commerce and trade become all important.

Occupations of the Nomads. On the fringes of the desert the soil resembles poor steppe land, and a pastoral population eke out a scanty existence in rude villages or pastoral camps

IN THE EGYPTIAN DESERT

The true nomads roam over the desert, engaged in camel and caravan driving, expressing in their camel songs the greatest contempt for settled life. Their temporary tents are of leather, grass, and brushwood. Raids on caravans are common, and even the women go armed. These latter enjoy great freedom, going about with uncovered faces and mingling in the conversation and business of their husbands.

The Bedwins of Arabia, whether settled or nomadic, lead a very similar existence. In general the desert life may be regarded as a continuation of the steppe life, with its pasture, and consequently the domestic animals, on which it depends for prosperity, reduced to a minimum. The horse is replaced by the camel as a means of transport. The extreme poverty of the life encourages the development, not merely of legitimate trade, but also of plunder and treachery.

Contrast between Cold and Hot Deserts. The hot and cold deserts have one feature in common, the lack of vegetation, and the consequent restriction of agriculture. The hot desert is indeed less bountiful than the cold, The latter is well watered, covered in many places with reindeer moss, and is rich in fish in summer. The Sahara offers little but the date palm—the staple article of food—and the camel, for transport. On the other hand the requirements of life are few and simple. Shelter and clothing are of much less importance than in an Arctic climate, and life can be supported on little. The dweller in the Sahara has further a resource denied to the miserable tribes of the frozen north. His desert lies between rich lands on either side, while the cold deserts are on the outskirts of the inhabited world. Trade in the Sahara becomes of great importance. The local trade is confined to dates and salt, but all the wealth of the rich interior is carried on camels across the desert, along well-known routes from oasis to oasis. Ivory, ostrich feathers, gums, spices, musk, gold dust, indigo, cotton, and palm oil are among the products thus transported. The shepherd of the desert fringe develops into the camel driver of the desert, and does not fail to use the opportunities for trade and plunder. The contact with civilization is close and constant, and though life in the desert shows in a marked way the influence of its environment, yet it is less primitive and isolated than that developed on the icy desert.

CHAPTER V.

LIFE IN THE EQUATORIAL FORESTS.

Tropical Forests. As we approach the Equator the rainfall increases, and near the Equator rain falls almost daily. The desert gives place first to a poor and then to a rich savana land, which becomes increasingly well-wooded until it passes at last into the virgin equatorial forest.

Distribution of Tropical Forests. The tropical forest covers wide areas in equatorial lands; the Malay peninsula and archipelago in Asia, much of the Congo basin in Africa, and the basin of the Amazon in South America.

Scenery of the Tropical Forest. The combination of great heat and abundant moisture gives incredible luxuriance to plant life. Trees known in temperate latitudes as dwarfs become giants, and compete with new and colossal species of forest trees, all struggling to push above the host of rivals; parasites and flowering creepers seize on trunks and branches to aid them in their struggle towards light and air; while below, in the moist, hot reek, orchids and fungi are entangled in a network of undergrowth which attains the proportions of a miniature forest wherever light can penetrate. A sombre darkness fills the forest aisles, for the thick foliage is hardly to be pierced even by the beams of a tropical sun. The forest is at once solemn and splendid. Some travellers have dwelt on its gorgeous plants and insects, its strange orchids and fantastic plant forms; others have found its beauty and brilliance less striking than its sombre majesty. Mr. Wallace, one of our finest naturalists, thus describes the forest of the Amazon: "There is a grandeur and solemnity in the tropical forest, but little of beauty or brilliancy of colour. The huge buttressed trees, the fissured trunks, the extraordinary air roots, the twisted and wrinkled climbers, and the elegant palms, are what strike the attention. But all is gloomy and silent, and one

feels relief on again seeing the blue sky and feeling the scorching rays of the sun."

Resources of the Forest. The trees of the tropical forests offer many valuable products. Mr. Wallace describes a walk in the Amazon forest with an old Indian, who pointed out to him tree after tree, here a medicine tree, there a tree good for making houses and floors, another whose wood made the best paddles, one best suited for 'pottery,' another for charcoal, others invaluable for food. Some trees are prized for the beauty of their wood, *e.g.* ebony or mahogany; others for their juice, *e.g.* the india-rubber, once the most valuable product of Brazil and West Africa, and the gutta-percha of the East Indies; others again for their strong durable timber.

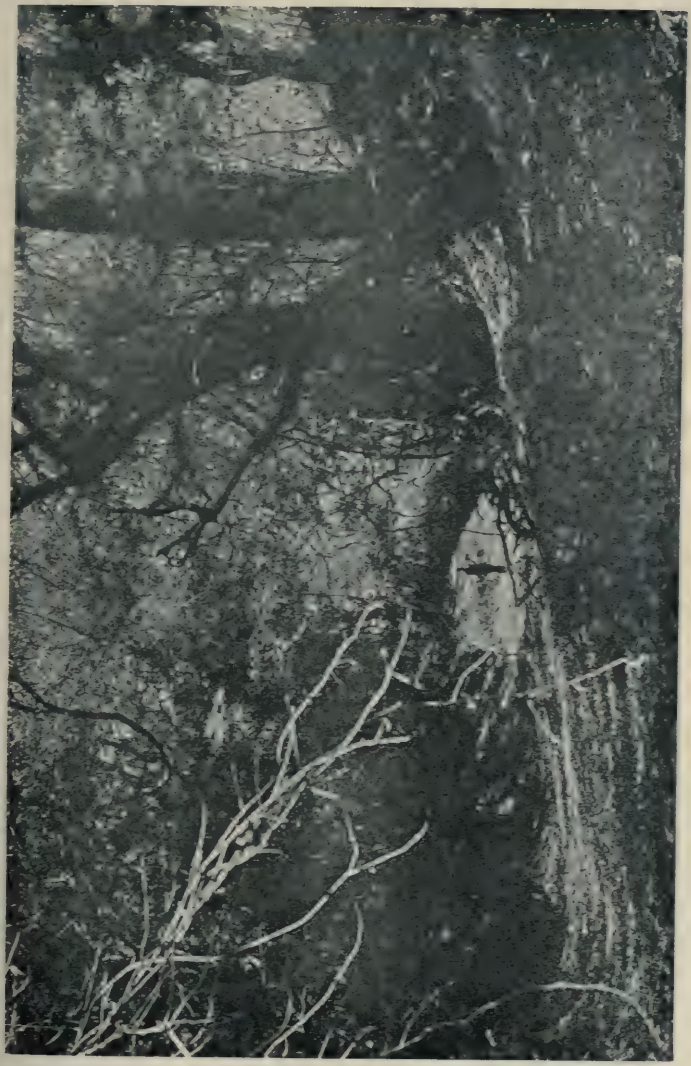
Animal Life. The luxuriance of plant life seems to have crowded out both man and beast. The African savanas are the home of the elephant, lion, antelope, zebra, gazelle, and many other beasts, but these penetrate but a little way into the forest. The South American tropical forest is equally devoid of animal life, with the exception of birds, reptiles, and insects.

Difficulty of Settlement. The conditions are equally unfavourable for human settlement. Paths are mere tracks a few inches wide, where it is impossible to pass except in single or Indian file. The undergrowth is perpetually struggling to obliterate the path. Clearing is most readily accomplished by fire, and in this way small agricultural villages are made, generally to be abandoned at the end of a season or two, after which the undergrowth fastens on the open space and soon destroys all trace of settlement.

Occupations of the Tropical Forest. The occupations possible in the forest itself are, fishing in the rivers; hunting the not very abundant game; collecting the valuable vegetable produce, *e.g.* rubber, gums, resins, sarsaparilla, and other medicinal products; and felling timber. Agriculture can be carried on in clearings and on the edges of the forest.

The Pygmies of the Congo Forest. The most remarkable of African forest tribes are the dwarf races, spoken of by ancient travellers as the Pygmies. They were long supposed to be fabulous, but in recent years they have been seen by Du Chaillu and other African travellers. The Pygmies are a tiny but well-formed race, rarely more than four feet in height.

Pygmy Occupations. The Pygmies are hunters. Their



ELEPHANT TRACK IN EQUATORIAL FOREST ON UPPER CONGO.

weapons are poisoned arrows, and their skill is unerring. They are also clever fishermen. They have no idea of agriculture, and such vegetable food as they need they obtain by barter from settled tribes. Most of the agricultural settlements attract these tiny marauders, whose agility and poisoned arrows make them formidable foes. They barter meat, hides, skins, ivory, feathers, and vegetable poisons for cultivated fruits and roots, tobacco, knives, and weapons. Knowing the forest as no settled tribe does, and possessing great keenness of eye and ear, agility, and endurance, they often find employment as scouts and guides to races larger and apparently stronger than themselves.

Pygmy Dwellings and Clothing. The Pygmies construct no fixed dwellings, for their life, like that of all hunters, is spent in wandering from place to place in quest of game. When they require bananas, of which they are very fond, they make their way to a clearing, and near that they build huts of leaves, in which they remain till their bargaining is finished. Their clothing, like that of many tropical tribes, is of the scantiest; but, unlike most lightly clad tribes, they take little or no trouble to ornament their persons.

General Mode of Life. The Pygmies are in most respects little better than intelligent animals. They have no domestic utensils, not even those for cooking; no arts except the making of weapons, nets, and traps; no music or games; no ties of family affection; no traditions of the past; and, so far as we know, no ideas of a future state. They represent the simplest type of society, living for hunting alone, with hardly a germ of the higher sentiments or desires.

Agricultural Tribes on the Forest Edge. At the opposite end of the scale are those forest tribes who practise agriculture in clearings on the edge of the forest. Thus Indian corn, beans, plantains, bananas, yams, potatoes, and other food crops are grown, the cultivation being chiefly done by the women, who also attend to the cooking, and most of the domestic industries. The men devote themselves to war, the decoration of their persons, and social pleasures, good and bad. The ease with which the scantiest labour yields an abundant return militates against steady effort. Clearings are readily abandoned, and the whole task of settlement then begins anew. This state of things is encouraged by the slave

trade, the greatest curse of Central Africa. Villages are constantly raided and destroyed, districts depopulated, and vast areas kept in a state of unrest fatal to steady progress.

Occupations in the Brazilian Forest. The Brazilian Forest plays a very important part in the commerce of the world. Rubber is the staple commodity, but cacao, sarsaparilla, Brazil nuts, tobacco, and articles in local demand also give rise to busy trade. Along the Lower Amazon and its tributaries is found almost every grade of civilization, from cities like Para at the mouth, to hunting tribes of the remote interior living almost as rudely as the Pygmies. Settlers of white or half-breed descent have plantations on which cacao, coffee, sugar-cane, tobacco, manioc, rice, and other tropical plants are grown. The methods are very backward, owing to ignorance and to scarcity of labour, a drawback always found in tropical countries where unoccupied land is abundant, and it is easy to live without hard work. On well managed plantations cane mills and sugar factories, saw and rice mills, may be found, but this is the exception. Tobacco is cultivated, gathered, and dried, chiefly by women and children.

The Indian readily intermixes with whites, and acquires a veneer of civilization. The primitive Indian is only to be found beyond the range of the white man or trader, along the remoter waterways of the great river.

Nomads of the Brazilian Forest. Along the main stream of the Amazon and its tributaries live half-civilized tribes. The houses of these people are usually nothing but wretched mud hovels. The men are away for long periods, fishing and collecting the produce of the forest, which they dispose of to the traders who visit the villages from time to time. The germ of settled life develops round the home, where the women cultivate in a rude way, spin and weave, make pottery, and practise other rudimentary domestic arts. Even among these semi-settled tribes, however, there is a good deal of family migration in the hot season, when all gladly return to the freedom of the forest. Manioc made into farinha, the universal substitute for flour, is taken, and the forest yields the rest. The women do their share of fishing and collecting, and at the end of the hot season the family returns to the settlement on one of the main streams.

The standard of civilization falls through tribes whose

agriculture is little more than planting things and leaving them to grow, and tribes who are incapable of even such rudimentary cultivation, till the lowest depth is reached in wandering savages, without home or habitation, who roam at will through the forest, sleeping where they find themselves, crossing streams in canoes roughly made from newly felled trees, to be abandoned when done with, and often making descents on settled tribes. These, though of ordinary stature and different race, correspond in culture to the Pygmies of the African forest, and are at the lowest level of humanity.

The Malayan Forest. The Malayan Forest is the home of numerous hunting tribes, rising through the same stages of progress, to the settled tribes cultivating rice in the wet jungles. In the east the sago palm makes life very easy, and the tribes are more backward than in the rice-growing area.

CHAPTER VI.

MOUNTAIN, PLAIN, AND COAST.

Influence of Elevation. So far climate has been considered chiefly with reference to latitude. A somewhat similar range of climate is caused by elevation. A mountain of sufficient elevation in tropical latitudes may represent all zones of climate and vegetation, from tropical forests at its base, through savana, deciduous forest with meadow glades, pine forests, wastes of lichens and mosses, to everlasting ice and snow on its summit.

Mountain Occupations. All occupations are theoretically possible—hunting in the forests, agriculture on the open land, and pasturage in the high meadows. The cultivation of the lower slopes of hill sides is familiar in our own country, especially in the southern uplands of Scotland, the upper slopes of which pasture mountain sheep, which supply excellent wool, *e.g.* Cheviot wool, and good mutton. In the same way the relatively flat Lowlands of Scotland are, on the whole, agricultural; the mountainous Highlands are either pastoral, noted for mountain sheep, or devoted to hunting in the shape of grouse moors or so-called deer 'forests.' The same distribution is even better seen in Switzerland, where on a single mountain side, the lower valleys and slopes bear abundant crops, while the flocks of cattle and goats are driven up in summer to the village meadow or alp, and the chamois is hunted higher still. In Sweden, cattle are yearly driven up to the saeters, or mountain farms, for pasture, much as the Mongolian shepherd leads his herds forth into the steppe.

Influence of Mountains on Life and Character. Mountain tribes show the influence of their greater isolation in many ways. They cling to relics of an earlier state of society, long after this has disappeared from the plain. Local dialects, dresses, and customs die slowly. Gaelic has survived in the Highlands

of Scotland, Welsh in the Welsh mountains, and various dialects in the mountain districts of Europe.

The Highlanders of Scotland still wear the tartan, and the kilt has not wholly disappeared. The Welsh national dress still survives in remote parts. The peasants of the Black Forest and of the Scandinavian highlands wear picturesque national costumes, which differ from valley to valley.

Isolation creates a strong feeling of clannishness and patriotism, for both of which the Highlanders and Welsh are remarkable. The patriotism of the hill-tribes of India, which occasionally causes outbreaks on the frontier, is similarly the natural result of their isolation in mountain fastnesses.

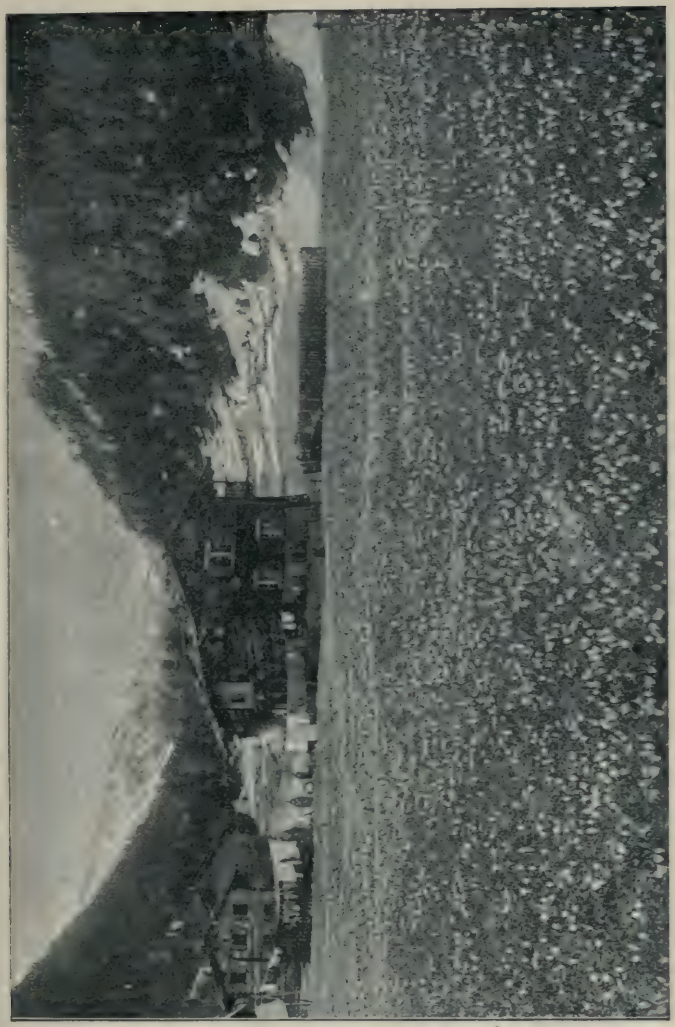
Mountain and Plain. The mountain concentrates a great variety of conditions in a small area; the plain presents a great similarity of conditions over a large area. Any occupations which develop on the plain have a larger field, and support a greater population, than those carried on in the mountains. Movement is easy on the plain, difficult on the mountains. This makes exchange, both in commodities and ideas, easy on the plain, while the mountain is a barrier to both. Thus, both trade and culture develop much more rapidly on plains than in mountainous countries. The inhabitants of the mountains are generally behind the inhabitants of the plains in wealth and material progress. This was well illustrated until recently by the difference between the Highlands and Lowlands of Scotland.

The Coasts. The last typical environment is that of the coast. Coasts may be either flat or rocky, and a coast of either type may be accessible or inaccessible.

Coasts unsuited for Fishing. Two kinds of coasts prevent easy communication between sea and land. The first are rocky coasts, rising out of deep seas, exposed to the winds. The second are sandy coasts, sloping out of shallow seas.

The rocky inaccessible coast is generally shut in on the land side also by mountains stretching down to the sea. It is, therefore, almost uninhabitable, and its thin population lives in chronic misery and poverty. Parts of western Ireland have a coast of this kind. Neither sea nor land yields enough to support the inhabitants, whose existence is exceedingly wretched and precarious.

A sandy coast, on the other hand, has often a rich interior, or hinderland, as it may conveniently be called. This is the



AN ALP OR MOUNTAIN MEADOW PASTURE.

case in the Hwang-ho delta. In such cases, the maritime situation exercises little or no influence on the mode of life or the occupations of the people, who live by agriculture, and pay little attention to sea-fishing. Such influence as it has is chiefly felt in the hindrance to trade by sea.

Coasts suited for Fishing. Two kinds of coast make fishing an occupation of great importance. These are fiord coasts in mountainous countries, and lagoon coasts in lowlands. Norway, and the west coast of Scotland, are types of the fiord coast; Languedoc, in France, is a type of a lagoon coast. Both possess calm waters, protected by natural breakwaters—of rocks in the one case, and of sand dunes in the other. Communication between sea and land is easy. Fisheries develop rapidly, first in the quiet enclosed waters, and later in the open seas. These gradually extend farther and farther. In Norway there is a large exodus every year of men, who go to the cod fisheries of the Loffodens. Others go to the more distant Arctic fisheries of seal and whale. They are accompanied by equally daring fishermen from the fiords of our own country and of Brittany.

Mode of Life among Fishing Races. Fishing is a semi-nomadic occupation, in which the boat plays much the same part as the horse on the steppe, or the camel in the desert. The home is fixed, and there the women and children remain while the men are at sea. The women usually carry on a little agriculture, and practise domestic arts. The farms on the Norwegian fiords are largely managed by women, whose husbands are away at the fishing grounds. Much power and responsibility is thus acquired by the women of fishing races, and among societies descended from fishing ancestry we find them enjoying political and educational privileges reserved for men in nations of a different origin. This is particularly well marked in our own country, which has a large admixture of Scandinavian blood.

Fishing Races and Trade. Races engaged in sea fisheries are usually adventurous traders. Their boats furnish them with a ready means of transport, and they are accustomed to a life of constant movement. This is particularly noticeable in archipelagoes, where seafaring is the chief occupation. Trade is always briskly carried on from island to island. Examples of this are seen in the Greek and Malay archipelagoes.

A NORWEGIAN FJORD.

Where a maritime country has little or nothing of its own to trade in, like Norway, which produces little but fish and timber, its inhabitants become carriers for the rest of the world, as the Norwegians have done. Where a country is rich, its sailors naturally trade at the outset in its produce. Thus, England long traded in the wool its flocks produced.

Fishing races are very ready to migrate. The Northmen, whose country—a range of mountains with good harbours in the sea-drowned valleys—was ill-suited to maintain a large population, early began the search for new homes. They attempted to seize Britain, and succeeded in establishing themselves in Normandy. They colonized Iceland and Greenland, and probably discovered the eastern mainland of North America. Dr. Nansen's recent Polar expedition is only the last manifestation of the old adventurous spirit of the Northmen. The Malays, another fishing race, have spread widely in Eastern Asia. The Pacific islands must have been the scene of constant migrations. Most of the natives are excellent sailors, and some of their outrigger canoes are models of skilful design and construction.

Fishing races are apt to pass from legitimate adventure to piracy. Many of the Northmen's voyages deserve no other name. The Mediterranean was infested with pirates from the earliest times until the beginning of the 19th century. The Malay and Chinese waters have had an equally bad reputation, which is still not undeserved.

Estuaries. An estuary brings the sea into the heart of the plain, and affords an outlet for its produce. Its importance increases as the cultivation of the plain proceeds and its manufactures develop. It serves the double purpose of providing an easy entrance for raw materials, and an outlet for manufactured wares. The estuaries of the Thames, Severn, and Mersey in this country, the Seine and Gironde in France, the Elbe and other rivers of Europe, are the seats of important manufacturing and commercial cities.

CHAPTER VII.

THE INFLUENCE OF OCCUPATION ON THE MODE OF LIFE

In the preceding chapters an attempt has been made, by means of concrete examples of life in the cold and hot deserts, in the temperate and tropical forests, and on the grass lands, mountains, plains, and coasts of the world, to show how the geographical conditions under which a race lives, force it to adopt a particular occupation, and how this occupation in its turn modifies the mode of life in many different ways.

In this chapter we shall look at the same set of facts in a more general way, comparing societies engaged in the same kind of work. We shall see that the same causes produce the same results, that is, that the same occupations tend to produce societies of the same general type. Thus, hunters resemble hunters, herdsmen resemble herdsmen, and husbandmen resemble husbandmen, in their general mode of life all the world over. The simpler any society is, the easier it is to detect these resemblances, but in complex societies, like our own, it is often exceedingly difficult.

Simple Societies. In a simple society everybody does the same kind of work, the character of which depends entirely on the geographical conditions. Food, shelter, and clothing, and all tools and utensils must be procured from the materials at hand. All these therefore differ greatly in different localities.

Mode of Life in Hunting Societies. The simplest occupations are those which men practice in common with the animals—the gathering of edible fruits and plants, hunting in the forests, and fishing in the forest streams. Tribes who procure their living in this way are continually using up the means of existence, and therefore frequently suffer from semi-starvation, or actual famine.

Such occupations involve a constant change from place to place, for the supply is quickly exhausted in a given area. In

their rudest form they are practised by wild tribes who roam at will over indefinite tracts of country, sleeping where they find themselves, and possessing no homes, utensils, or even tools, other than the simplest weapons. Few hunters accumulate property of any kind, owing to the impossibility of carrying it with them on their constant migrations.

Such races are always small in numbers. The hardships of their life cause a high mortality, especially among young children. Many children are killed as soon as they are born, to save the trouble of providing for them. Cannibalism is also not uncommon, especially in times of famine. The sick and aged, and all who cannot keep up with their movements, are generally left to perish.

Such tribes quickly disappear before a superior race. They have nothing to call their own in addition to their weapons except their skill of hand and eye. These cannot be handed on at will like land or domestic animals. Children must acquire them for themselves, as their fathers did before them. There is therefore little progress from generation to generation.

All hunting societies, of course, do not remain permanently at this level. Many learn to make skilful and beautiful weapons, like the Eskimo harpoon. Others construct excellent boats, like the kayak of the same ingenious people. Others learn to collect products of commercial value, like rubber and ivory, and thus to add to their resources by trade. Few, however, rise high until they begin to combine settled occupations with their wandering and precarious life. This usually happens when the women and children are regularly left in temporary shelters while the men are hunting in the neighbourhood. Various arts and a little rude cultivation generally arise round this germ of a settled home.

Distribution of Hunters. The hunting races of mankind are found in the forests of the Old and New World, on the northern tundra, and in poor regions like Australia, which suffers from almost perpetual drought and produces few animals or edible plants, and Tierra del Fuego.

The lowest races known to us are the miserable Fuegians, the Australian aborigines, and the most backward Indians of the Amazon forest. The Bushmen of South Africa, hunters who have been pushed from the forest on to poor steppe land, rank but little higher, and the Congo forest Pygmies are only

superior in the character of their weapons and dwellings. The Hottentots, who combine cattle-keeping with hunting, are disappearing before the white man, like the tribes of Redskins who hunted bison on the prairies of North America. Many tribes in the Malayan forest live chiefly by hunting. Several of the tribes of the Amazon forest depend on fishing, for which they use a bow and arrow.

The most reliable standard of progress among hunting tribes is the quality of their dwellings and weapons, and judged by this test the Eskimo rank very high.

Fishing Societies. Tribes engaged in fishing in inland streams may be regarded as hunting tribes. Many of them use the same methods, and shoot fish with bows and arrows. Fishing societies proper are those engaged in sea fishing, an occupation which produces a strong and adventurous race of sailors and traders. The fishing peoples of the world occupy the coasts of continents and islands. Like hunting tribes, they are engaged in destroying the resources of nature, not, like herdsmen and husbandmen, in increasing them. The sea, however, is almost inexhaustible, and therefore fishing races lead a less precarious existence than hunters. The men are nomadic, but the presence of women and children on fishing expeditions would fill the boat with useless members, and they are therefore left behind in villages on shore. A little cultivation begins round the home, and the keeping of any suitable domestic animals. Such a society readily passes into the settled stage, though the men are necessarily frequently away from home.

Transition to Pastoral and Agricultural Life. Hunters and fishers are constantly destroying the means of existence, without doing anything to increase them. A higher stage is reached when men cease to live by destroying, and begin to create new resources. This takes place as soon as they begin to keep and domesticate animals, or to till the soil. Such societies rapidly increase in wealth and numbers.

Distribution of Pastoral Societies. Pastoral life, or the keeping of domesticated animals, develops on the grass lands of the world. The steppes of the Old and New World and the tropical savanas all support pastoral peoples. On the tundra the reindeer has been partly domesticated, and a semi-pastoral, semi-hunting society has developed. The life of the Mongolian

shepherds on the Asiatic steppes has already been described. The savanas of Central Africa are occupied by pastoral tribes, *e.g.*, the Damaras and Masai. Much less advanced are the semi-pastoral Hottentots of the poorer South African steppes. In Australia the natives never became pastoral, owing to the absence of animals suitable for domestication.

Many of the steppe lands of the world are now occupied by Europeans, who turn to the same occupation on a larger and more scientific scale.

Mode of Life in Pastoral Societies. The herdsman's life ranks higher than the hunter's, for it provides more than is required for the present need. Flocks and herds produce young, and thus create a steady increase of wealth. Herdsmen are therefore capitalists. The mode of life is, however, still precarious, for drought or cattle-plague frequently reduces a wealthy tribe to poverty. The Samoyads have become exceedingly poor in consequence of plague among their reindeer. The rinderpest in Africa nearly ruined many native pastoral tribes, as well as European colonists. The life is therefore midway between the extremely precarious life of hunting tribes and the moderately secure position of agricultural races.

The herdsman's life is nomadic. "Pastures new" are essential to the well-being of his herds. Most pastors, however, possess beasts of burden, such as the reindeer on the tundra, the horse on the steppe, or the camel in the desert. Thus, migration is much easier than when a hunting tribe wanders on foot in single file through narrow and obstructed forest paths, with no beasts of burden but its women. The accumulation of household gear and utensils is no longer prevented by the difficulty of moving them from place to place, and thus a pastoral race, at a very early stage, begins to increase its comforts and to rise above the level of hungry animals. Property becomes a sign of wealth and an object of respect. Land is not of course allotted to individuals, for a tract of pasture would soon be exhausted if continually grazed over. Instead of small holdings held by individuals, we find large tracts owned by groups, generally related in blood. Flocks and herds are held in the same way. The tent, carpets, rugs, dresses, and tent stuffs are rather family property, belonging to the head of the family for the time being.

Modes of Life among Agricultural Races. Agriculture, the

NATIVE KRAAL IN MASHONALAND.

most laborious but the least precarious of human occupations, begins at a very early stage. It appears more readily among hunting than among pastoral peoples. This is probably because among hunters, except those of the lowest type who are ignorant of agriculture, the women are less nomadic than the men, and while accompanying them on their general migrations, frequently remain in temporary shelters while the men are hunting in the neighbourhood. Among tribes at this level in the Brazilian forest, the women plant manioc or other useful plants, which either yield a return before the move to the next hunting ground, or are ready when the family returns some months later to its haunt. Such cultivation would naturally be slower to appear in pastoral societies, because these possess beasts of burden and do not experience the same difficulty as hunters in taking their women and children with them. Moreover, the women are fully occupied in milking and looking after the young animals, or in utilizing the wool and skins yielded by the flocks. Thirdly, the climate is generally too dry for much success to attend any such attempts at cultivation, and therefore they would not be repeated.

Once introduced into any society, agriculture rapidly leads to settlement. Land is allotted, first to groups cultivating in common, and later to individuals. The occupations formerly performed by one person are divided among many. These are sub-divided in their turn, giving rise to an ever-increasing number of new occupations. A corresponding development of exchange goes on, and traders become a special class. Others busy themselves with education and administration, and thus a very complex society grows up.

Looking at the world as a whole, there is seen to be a gradual transition from precarious occupations, like hunting, to those which afford a more secure living. What form these take depends chiefly on geographical conditions. No matter how desirable it might be, the frozen tundra cannot support an agricultural society, nor can cattle be kept in the desert or in those parts of Africa ravaged by the tse-tse fly.

The Influence of Occupations on Dwellings. The nature of an occupation leaves its mark on the dwellings, the food, and the clothing of a race.

The nature of the material employed for the construction of human dwellings depends on what is available. Grass, reeds,

FIJIAN HOUSE.

the branches, bark, and leaves of trees, the skins of animals, wood, stone, and even ice and snow, are employed in different parts of the world.

The form is determined by the nature of the occupation. Neither herdsmen nor hunters build fixed dwellings. The great difference between the houses of the two depends on the fact that the herdsman has beasts of burden to assist in moving his dwelling, while the hunter has not. The dwellings of herdsmen, therefore, though portable, are of considerable permanence and value, while those of hunters are often nothing more than rude shelters, intended to serve only for a night or two.

It is not quite correct to say that the houses of hunters are movable. Whether they are or not depends on the scarcity or abundance of materials. As a rule, where branches, brushwood, reeds, grasses, and similar materials are abundant, it is customary to leave the hut, since it costs more trouble to carry it away than to make a new one. This remains the custom even among semi-pastoral hunters. The Samoyad and Ostyak tribes who live on the edge of the forests, do not move their tent-poles, though they might easily do so with their reindeer. Others, who are farther from the forest, and cannot easily procure timber, regard the same tent poles as most valuable property, and would never dream of leaving them.

Lowest among human peoples are those who construct no shelters at all. The Bushmen creep into natural shelters, or plait together the hanging branches of suitable "bushes" as a sort of roof over their heads. The Australian shelters are of little, if any, higher type. Fuegians often sleep on their canoes or rafts. The Samoyads and Lapps, who are forced by their climate to make shelters of some kind, construct portable tents of poles covered with birch bark or skins. The Eskimo, compelled by their long, dark, cold winters to remain for months in one place, make rude but substantial houses of ice and snow, the only available materials. The houses of tribes who combine hunting with agriculture are of a much higher type, and belong rather to the settled dwellings of the world.

The herdsman's tent, as already pointed out, is portable but permanent. Almost all the pastoral tribes of Africa are skilful in constructing light, easily moved dwellings, but the perfection of tent is reached in the well constructed, commodious, and

strongly covered yurt of the Mongolian shepherd. In most cases the flocks supply most suitable materials, either in the form of leather, as among the Bedwins, or of hair for making felt, as on the Asiatic steppe. Among all pastoral tribes, the tents are generally pitched in circles to afford greater security to the herds.

As life becomes settled, it is found more economical to build better houses of more durable materials. The agricultural tribes of Africa build good houses of palm, bamboo, cane, and palm thatch. The Malays are perhaps the best builders among semi-civilized tribes. Common dwellings, to contain a large number of persons, are found in many parts of the world, from Alaska to Central Africa. In the neighbourhood of forests wood is naturally used, and the dwelling becomes more and more elegant according to the length of time it is expected to last. The log hut of the American settler is a rude erection, but the timber houses of the cities of the middle ages, or of the German and Swiss forests to-day, are picturesque in the highest degree. As the forests are cleared, and men gather into cities, wood is replaced by marble, stone, and brick. These in their turn give place to still more strong and durable iron and steel, which are used, at least for the framework, in many of the modern American "sky-scrapers."

Human dwellings, therefore, range from the rudest hut of twigs and branches, little better than the lair of an animal and abandoned after a night's use, to the stately marble palace intended to last for centuries.

The Influence of Occupation on Clothing. Primitive tribes must be content with such clothing as they can procure from their immediate surroundings. In hot climates and among backward races it is generally reduced to a minimum.

The simplest form of dress is the petticoat, or apron of unplaited grass or reeds, worn by wild tribes in hot climates. The bark of trees is another material within the reach of almost all. As races advance, these materials are manufactured and ornamented. Reeds and grass are skilfully plaited and artistically coloured. Bark is made into a sort of cloth, often of real elegance, like the tapa, or beaten bark cloth of the Pacific islands.

A large section of the human race, among both hunters and herdsmen, is dressed in the skins of animals. These may be

worn in an almost natural state, as the furs of the Eskimo and other northern tribes; tanned into leather, which was still the common wear of our poorer classes three or four centuries ago; or woven into fabrics like the camel hair cloth of the steppes.

As a race adopts settled life, division of labour, and exchange, it ceases to depend entirely on its immediate surroundings for clothing, and all raw materials, whether home-grown or foreign, go through elaborate processes, first of manufacture, and then of making-up. The modern Englishman is dressed partly in wool and linen manufactured from home-grown materials, but this simple wardrobe is supplemented from many lands. Australia sends wool, China silk, America cotton, Africa ostrich feathers, the Arctic seas and Siberian forests furs of seal or sable, while the sea depths are ransacked for pearls, and the recesses of the rocks for gold and precious stones.

Influence of Occupation on Food. In the same way food varies with climate and occupation. The lowest tribes live on edible roots and fruits, birds' eggs, and such fish and flesh as they can procure. They frequently suffer from famine or semi-starvation. The Eskimo subsists entirely on animal food in the form of seal meat and blubber. Flesh forms the chief article of diet among all hunting tribes.

The pastoral races live on the produce of their flocks and herds, and milk plays a very large part in their diet.

Many agricultural races are almost entirely vegetarian.

The most advanced races enjoy a mixed diet, brought from all parts of the world.

The preservation of surplus food is a matter of great importance to all societies. The hunting Indian tribes of North America converted their surplus meat into pemmican, and the Europeans were glad to learn the process from them. The Brazilian forest tribes dry and smoke fish. Nature refrigerates the surplus food of the Eskimo. The same problem is equally important for the modern European, who owes his varied diet to the improvement in methods of preserving food. Frozen and canned meat is brought from the other side of the world. Fish is salted, dried, smoked, or canned. Milk is preserved in the form of butter and cheese. By means of these and similar methods surplus food can be economized, and an exchange of food material is rendered possible.

CHAPTER VIII.

AGRICULTURE.

Origin of Agriculture. We do not know how, when, or where agriculture began. It is not found amongst the lowest races. The Fuegians, Australians, Bushmen, and many tropical forest tribes have no idea of sowing and reaping. Their notions are limited to gathering such roots and fruits as they have found to be fit for food. Some Australian tribes go so far as to punish the uprooting of plants bearing edible fruits. They have realized the folly of recklessly destroying a permanent source of food, but have not yet thought of attempting to increase it by efforts of their own.

A very simple form of agriculture is practised by the women of many hunting tribes, who are frequently left behind while their husbands are away on hunting expeditions. Such attempts at rude cultivation in the Amazon forest have already been described.

It is possible that agriculture everywhere began in this way. When such experiments turned out well, they would be repeated, and agriculture of a primitive kind would gradually take a place among the occupations of a tribe. As game became scarce, or the attacks of stronger neighbours reduced the area of the hunting grounds, it would naturally become more important. In the end many wandering tribes would give up their wandering life, remain for longer and longer periods in settled dwellings and villages, and begin to practise various arts and industries.

So long as the men are still hunters, we always find the cultivation left almost entirely to women. As societies settle, the men take a larger and larger share. In advanced societies they do all the hard work, leaving to women that which requires time and patience rather than strength. In our own country much field work of this kind is still done by women,

and even children are employed to frighten birds from the sprouting grain.

Agriculture has developed much further in some parts of the world than in others. Many tribes have got no further than sticking a handful of shoots into the ground and leaving them to grow. Others have learned to preserve seed from harvest to the next sowing time. Still more advanced peoples understand manuring, change of crops, grafting, irrigation, and similar methods of increasing the yield. Among the most highly civilized nations agriculture has become a science as well as an art.

Climate and the Development of Agriculture. Agriculture is most easily undertaken in **tropical lands**, which offer highly favourable conditions for every form of plant life. Moisture and heat are both abundant. A vast amount of decaying vegetable matter enriches the soil and makes it exceedingly fertile. In many parts of the tropics crops ripen all the year round, producing not one but many harvests. The planting of a few banana or manioc shoots is all that is necessary to secure an abundant supply of food. Agriculture is therefore slow to improve, for where a little trouble is enough, men are not inclined to take more. Many agricultural African tribes abandon a clearing when the soil begins to show signs of exhaustion, and move on to a new one, which they exhaust in its turn. It is only when such simple methods are no longer possible, that land is economized, and more troublesome crops introduced. In tropical Africa many stages of agricultural progress are found, from the nomadic agriculture of the migratory tribes to the excellent cultivation of many negroes.

The **desert** consists of naturally fertile soil. The absence of vegetation is entirely due to drought. The Sahara has rich oases round wells and water courses. Egypt owes its inexhaustible fertility to the annual floods of the Nile, which deposits layers of fertile mud on the flooded lands. Wherever water can be obtained, excellent agriculture can be carried on. The dry sand which covers much of the desert, prevents the evaporation of any moisture which sinks through, and water is often to be obtained by sinking wells through the upper layers of sand to the moister layers below. Proper irrigation has brought, or might bring, under cultivation large tracts of land in Persia, Central Asia, and other dry regions.

The steppe lands are, as a whole, too dry for agriculture to develop there spontaneously. Most of them are only suitable for pasture, unless irrigation is employed. These lands have been turned to the keeping of domestic animals rather than to agriculture, and examples of steppe cultivation are not numerous, except under the influence of a race which has practised agriculture elsewhere under more suitable conditions.

In the **temperate lands** agriculture is carried on in forest glades and clearings. Rain is abundant in most parts, but sunshine is not so plentiful. The natural fertility of the soil is much less. As we pass from the equator to the pole, the summer becomes shorter, and the unproductive winter longer. The harvest is gathered but once yearly, and many cereals will not ripen in the shorter summer. Those which do must be grown from seed, which must be carefully preserved from the last harvest. To compensate for the decreased fertility the soil must be carefully tilled and fertilized. After all this has been done, success is by no means certain. Two dangers are still to be feared: drought may parch the grain, as frequently happens in the interior of great continents; or cold, wet, sunless autumns may rot it before it is ripe, as too often in our own country.

The **tundra** has all these drawbacks in a still more extreme form. The winter is longer and darker, the spring later, the summer shorter. Cultivation is possible only in a few favoured spots. That it is possible at all is due to the number of hours of continuous daylight during the long Arctic summer day, and to the moisture produced by the thawing of the frozen soil in spring. The growth of vegetation during the short period of almost continuous sunshine is enormously rapid, but it lasts too short a time to allow cereals to ripen. Some Lapps within the Arctic circle do indeed grow barley, but the harvest is always uncertain, and if the spring is later than usual or the first autumn frosts earlier, the crop fails. Over most of the tundra snow lies till June, and the two-month summer is not long enough to allow of thawing, germinating and ripening before the sun begins to sink below the horizon, and the first snows of autumn fall.

Agriculture in the Tropics. Cultivation from shoots. The tropics offer a great variety of easily grown plants which form the food of large sections of the human race. The most

important are the banana, and its relative the plantain, the sago palm, and the coco-nut palm. The banana and the plantain are among the most valuable articles of food in tropical Africa, South America, the East and West Indies, and the islands of the Indian Ocean; the sago palm, which grows in great forests in New Guinea, the Moluccas, Celebes, Philippines, and other East Indian islands, is the chief food in the east of the Malay archipelago; and the coco-nut palm is the staple article of vegetable food in the islands of the Pacific. All these are grown with very little trouble, and are exceedingly productive. Another group of plants, *e.g.* the manioc, yam, sweet potato, and taro, so important in Fiji and other Pacific islands, are cultivated for their edible stocks or roots.

The **banana**, introduced from the East Indies into most of the tropical countries of the world, yearly sends up new stems from its root stock, dying off itself after bearing fruit. Less than a year later the young trees are loaded with fruit. They then die off in their turn, but supply shoots for fresh plants. Such labour as is necessary is limited to clearing the ground for new plantations, and to putting in cuttings. The old plantations renew themselves. Thus, with very little labour a permanent supply of food is obtained. Mr. Stanley, in exploring the Congo, established many posts, and his first care was always to plant a banana grove, and thus secure his expedition against want of food.

The **sago palm** is cultivated in much the same way. Once formed, a plantation renews itself without further care, and new ones can easily be made by a little clearing and planting. A little labour is, however, required before sago is fit for food. The eatable part is obtained from the pith, after the trunks have been cut into lengths. A month's work provides twice as much sago as can be used in a year, leaving half available for exchange. The tree matures all the year round, and thus there is no season at which food cannot be obtained.

The **coco-nut palm** forms the staff of life in the South Seas, where it is probably a native. It prefers a sandy soil near the sea, and therefore does well on islands. Its seeds, the coco-nuts, fall into the sea, and are borne by currents about the Pacific. Wherever the growing coral islands afford a foothold of soil the coco-nut palm takes root. After seven or eight years it begins to bear fruit four or five times a year, and continues to

BANANA PLANTATION, WEST INDIES.

do so for three-quarters of a century. When such islands become inhabited, this invaluable tree supplies all the necessities of life. Its flesh makes a palatable food; its milk is drunk while sweet, or fermented into arrack. The shells of its nuts are made into cups and bowls, its fibres are plaited into mats and fabrics, its leaves are used for thatch, mats and baskets, its stems for the framework of houses and boats, and the strong mid-rib of its leaves for oars. Even its roots have their work to do in holding the sea-washed islands together, and preserving their covering of soil.

The **bread-fruit** tree is almost as important as the coco-nut in the same region. It is said that six bread-fruit trees will keep a family.

Manioc, a widely-used edible root, is propagated by cuttings, and is ready for use in six months. At most, it needs only a little hoeing. In Honduras, the plantations are laid out and left, the natives returning half a year later to gather the crop. On the banks of the Amazon the women take a handful of shoots in July or August, and plant them in the rich alluviai soil left by the falling river. A large crop is ready in January or February without any further attention.

Manioc is the staple food of tropical South America. It is also largely grown in the West Indies, where it is known as cassava, Central Africa, and other tropical lands. Its preparation is a little more troublesome than its cultivation. The root contains a poisonous juice, which must be extracted, or rendered harmless, before it can be used for food. In South America the dried and grated root is known as farinha. In our own country a preparation of manioc (tapioca) is used for puddings.

The bad side of the luxuriance of nature in the tropics is well illustrated by the backwardness of agriculture among South American tribes. Sugar, coffee, rice, cacao, and an infinite variety of delicious fruits might easily be grown in any quantity, and of the finest quality. Yet most tribes are content with a monotonous diet of fish and farinha, because manioc can be raised with the least trouble.

On the other hand, many tropical tribes have resisted this temptation to idleness, and have made as much progress as the nature of the crop allowed. None of the tribes which confine themselves to cultivation by cuttings, ever reach the level of tribes which cultivate from seed, and they usually subsist on a

much less varied diet. Few, however, are as backward as the Indians of the Amazon forest. Polynesian agriculture, in particular, is more advanced than might be expected. Samoa has been described as one great garden, with groves of coco-nut and bread-fruit every mile or two. In some districts of New Guinea, where the bread fruit is not found, the soil is carefully prepared by the men, who take their stand in long rows and break it up with digging sticks. Boys follow and break it still finer, and, if necessary, rub it fine by hand. Bananas, yams, sugar-cane, and other tropical crops are planted, and the fields are fenced and weeded by the women. In New Britain, and some other islands, the plantations are terraced for irrigation. In Tonga, agriculture is very good, for the soil and climate are not so extraordinarily good as to encourage idleness, nor so bad as to discourage effort.

Tropical Agriculture. Cultivation from Seed. A great advance is made as soon as tribes begin to cultivate millet, maize, rice, and other crops from seed. All these involve much more labour, and develop the ingenuity and foresight of the tribes engaged in their cultivation. Better methods of working the soil, improved implements, the use of fertilizers, terracing, and irrigation are gradually discovered, and agriculture passes from the stationary into the progressive stage. This is especially noticeable wherever rice is cultivated.

Maize is very widely grown in tropical and sub-tropical lands. In North America it was known before the coming of the Europeans, as its popular name, Indian corn, shows. The cultivation was carried on by the old men, women, and children, while the younger men were away hunting. The soil was broken up with digging sticks just deep enough to enable weeds to be taken out by the roots. On the edge of the equatorial African forest the climate is so favourable that maize will ripen all the year round. On the Shiré highlands, where the natives are excellent cultivators, it is one of the chief crops. There, all the people of a village turn out to work in the fields. Every care is taken to secure a good crop. Trees which would keep off too much sun are cut down, and the maize fields are watered by women with watering pots made of gourds.

Millet is largely grown along with maize in many parts of Africa. Its varieties are very numerous. It is an important food-stuff in a great part of Africa and India. It is, however,

difficult to store in tropical climates, and in Central Africa, where it will scarcely keep till the following harvest, much of it is brewed into beer.

Rice is one of the most important foods of the world, and feeds a large section of the human race. It is largely grown in the densely populated lowlands of Eastern Asia, where its great productiveness makes it a valuable food crop. It is less used than millet in India proper, but its importance increases to the east, and it forms the staple food in Japan, China, Further India, the Philippines and adjacent islands.

The cultivation of rice is very laborious. It requires abundant heat and moisture, and therefore suits river deltas, where the fields can be flooded at the proper time. To secure proper flooding, canals and trenches are constructed, by which water can be introduced or drawn off as required. The fields, which must also be carefully levelled, are embanked to prevent the water running off. The growth of rice is extraordinarily rapid. When the fields are under water, it grows several inches in twenty-four hours. The fields require careful weeding, and this is a very hard task when they are knee-deep in water. Many rice-growing countries grow and use large quantities of opium, probably because this drug deadens the rheumatic pains which naturally result from this constant soaking.

The care, labour, and unremitting attention which the cultivation of rice requires, has developed a very high standard of agriculture among rice-growing nations. In no country in the world is agriculture so honoured as in China. The emperor himself visits the rice fields every year, to show that agriculture is the foundation on which the prosperity of the state depends. The Chinese spare no pains to secure good crops, of which they obtain two annually. The embankments of their rice fields are planted with mulberries, which bind the banks together, afford such shade as is required, and also feed thousands of silk worms. The irrigation ditches are stocked with fish after the rice has ripened, and thus the rice fields furnish another source of food between crops. It is by such wise economy that China feeds an immense population.

Though rice is the staple crop, many other important plants are cultivated. Tea and opium are perhaps the most important. Tea is grown on the hill slopes, where the abundant rains which the plant needs can run rapidly off and not gather about the

roots. Tea is almost as much used as rice in China, and large but decreasing quantities are exported.

In Japan rice is the staple crop, but millet, barley, hemp, sugar, tea, and an immense number of other crops are also grown.

In Further India, another rice-growing country, almost as much enthusiasm is felt for agriculture as in China. The embankments of the rice, or paddy fields, as they are called, are planted with mulberries in the same way. Sugar and tea are grown. The soil is kneaded by buffaloes, and a plough is universally employed.

In the Malay archipelago many tribes, *e.g.* the Battaks and Dyaks, live chiefly by their rice fields. The former are the best cultivators among the Malays. Their rice fields are terraced and well irrigated. They are constantly hoed by women, and the ravages of vermin are checked as far as possible. The Dyaks are far inferior. For want of proper irrigation they are obliged to make new fields every year or two. Agriculture falls off rapidly to the east of the archipelago, where the sago palm is so easily grown that there is no inducement to cultivate the more laborious crop.

In India agriculture has an importance which we can hardly realize. It is the occupation on which the prosperity of the country depends. Nearly three-quarters of the grown male population are engaged in it. Rice, which has been grown for many centuries, is the largest crop. Millet comes next, and is even more important as an article of food. Wheat, barley, and potatoes, cotton, opium, indigo, jute, tea, and coffee, are all grown, the variety of climate and elevation causing a similar variety of crops, which include both tropical and temperate plants. The chief danger is drought, which causes frequent famines. Irrigation is carefully attended to. The mountain slopes are often terraced for this purpose. The methods vary from the very simplest among the hill tribes to highly practical ones in parts which have been cultivated for many centuries.

Agriculture in the Desert. In the desert agriculture is possible only in oases, or where irrigation can be employed. The date is the most characteristic food-tree of this region, and is found on all oases. A great variety of other crops can be grown wherever water is obtainable.

STEAM THRESHING ON THE

Egypt, the narrow band of fertile country lying along the banks of the Nile, may be regarded as one great oasis. Its fertility is inexhaustible, and has been proverbial from the earliest times. It produces cotton, cereals, fruits, and many other crops.

In the Nubian desert great attention is paid to agriculture. The cultivated land is a strip along the Nile, varying from a few yards to a few miles in width. The water is brought by means of water-wheels into ditches running through the newly-tilled fields. The soil is easily worked, but the regulation of the water supply involves constant labour. Maize, millet, and beans are the chief crops.

The oasis of Northern Arabia produces cereals, including maize, wheat, and barley. The vine is also grown. Harvest and seed-time go on all the year round.

Agriculture in the Steppes. Agriculture is very little developed on the Asiatic steppes. It is regarded with contempt by most pastoral people, who consider a settled life little better than slavery. The climate is, on the whole, too dry for very successful agriculture without irrigation. Crops often fail, and this acts as a check among a race little disposed by tradition

PRAIRIE LANDS OF CANADA.

or education to change their mode of life. Few of the Kirghiz attempt it, but the Turkomans do so more readily if they lose their herds. Russian influence is doing much to encourage agriculture, and to introduce terracing and irrigation. Wheat, vines, cotton, and most sub-tropical fruits can be grown under proper conditions.

Parts of the steppes of Siberia, America, and Australia are cultivated by European colonists, who have replaced hunting and pastoral tribes. Great areas of grass-land in Russia and the Plate Basin are now cultivated.

Temperate Agriculture. In the clearings of the temperate forest agriculture is carried on over the greater part of Europe; in Southern Siberia, Northern China, and Manchuria; in the United States and Canada; in the Plate basin and Southern Chile; on parts of the plateau of South Africa; in Australia, south of the tropics, New Zealand and Tasmania.

There are three well-marked climatic regions.

In the first the rainfall is fairly uniformly distributed over the whole year. These are the coastal lands of the regions named. Crops often rot before they ripen from excessive rain

in late summer and autumn. The potato is a suitable crop, and is much cultivated.

The second region has summer rains. These fall on all the inland regions except the Mediterranean, Californian and Cape regions, Southern Chile, West and South Australia, and the western part of Victoria. It includes all the great wheat lands of the world—Russia, Siberia, North America, and the Plate basin. The chief danger is drought, caused by the failure of the early summer rains.

The third region has winter rains. It includes all those inland regions mentioned as not receiving summer rains. The cereals are grown as a winter crop, and generally require irrigation. The quality is good, but the yield is often scanty. Fruits do admirably. The vine, olive, fig, orange, lemon, peach, apricot, pomegranate, come to perfection, and most of the countries in the region of winter rains do, or could, produce excellent wine.

Cereals are the most important food crops of temperate lands. Wheat is the chief food-stuff of the world, and its use increases as the standard of living rises. No other cereal makes such a palatable and digestible bread. Rye bread is largely used as a substitute in North Germany and Russia, as oatcake used to be in Scotland. The use of both is decreasing, and oatcake, at least, is eaten rather from choice than necessity. Wheat is grown between 40° and 52°, where other conditions are suitable, and in lower latitudes at a great elevation. Barley, chiefly used in distilling, is grown farther north as well as farther south. It has a wider climatic range than any other cereal, for it will ripen occasionally within the Arctic circle, and is grown almost as far south as the equator. Rye is much grown in eastern and central Europe. Oats are grown north of wheat, and on the higher lands within the wheat area. Maize is grown south of 42°, and is largely used in the form of meal and hominy.

The agriculture of most temperate lands is very advanced. The inferiority of soil and climate has left no choice but to employ the best implements and methods. Most of Europe has long been cleared. The arable land, which has been worked for many centuries, is carefully ploughed, fertilized, and successively planted with different crops in what experience has shown to be the proper rotation. In the newer lands, like

those of North America, much of the arable land has first to be cleared of forest, a long and difficult task as the stumps must be extracted before proper ploughing is possible. For this reason the eastern United States of America were settled much more slowly than the treeless prairies farther west. There it is only necessary to break in the soil with the plough, and the area of the arable land is rapidly extending to the extreme limit of suitable climate.

Mixed Farming. In all the old agricultural lands, and, to a certain extent, in the new also, mixed farming is largely adopted, that is to say, both stock and crops are raised. The introduction of the turnip and similar root crops to Britain, some two centuries ago, revolutionized the conditions of keeping live stock, which can now be fed on turnips in winter. This in its turn has made the rotation of crops easier, by applying to a useful purpose such root crops as are grown for the sake of the soil. Mixed farming is thus doubly economical. On much of the arable land of North America maize is similarly used to fatten pigs or hogs, which are the most important live stock till the grass lands and cattle ranches are reached. Live stock furnishes a considerable amount of dairy produce, in the form of butter, cheese, and eggs. Some European countries, *e.g.* Holland and Denmark, which have no large area of arable land, devote themselves to dairy farming, which they find very profitable. Ireland also does a large amount, and so do France, Switzerland, and Italy. Dairy farming is also growing rapidly in Eastern Canada, especially in Ontario.

The Antiquity of Agriculture. In the long-settled countries of the Old World agriculture dates back to what is called the prehistoric period, of which we have no written records. In the remains of the ancient lake dwellings of Switzerland, whose antiquity is very great, grains of wheat and barley have been found, in some cases made into a sort of unleavened cake. Fruits like the apple and pear are also found, sometimes cut in half and dried for winter use. Shreds of woven flax are also found, together with stone implements of a very early type, showing that the use of metals was not yet known. This shows that agriculture was fairly advanced before Europe had passed out of the stone age. Great agricultural civilizations were flourishing in the Nile valley, Mesopotamia, and China,

several thousand years ago. The Spanish conquerors of Central America found prosperous and wealthy agricultural civilizations in Mexico and Peru, to which we owe many plants now cultivated over the world. The recent exploration of Central Africa has shown that tribes of the interior have developed an excellent agriculture of their own. Their implements are simple in type, and they are ignorant of many methods practised by more advanced races, but it would be dangerous to argue from this that their agriculture is of comparatively recent origin. It is at least as probable that it has been practised in the same way for many centuries, and that the methods in use have not developed further, because they were quite sufficient for the excellent soil and climate.

The Stages of Development in Agricultural Societies. An agricultural society appears to pass through several stages.

At first it adopts agriculture almost unconsciously, and as a supplement to hunting, its chief occupation. The Indians of Honduras who plant out their manioc, and do not return till it is ripe, are at this stage.

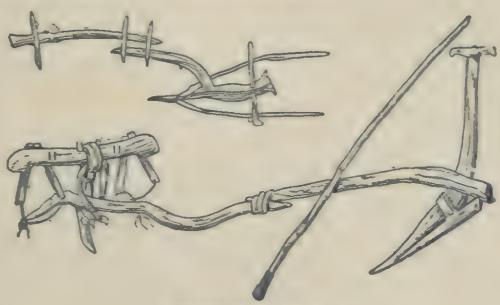
In the course of time tribes whose hunting grounds are growing smaller, or who are exterminating the game, come to rely more and more on what they cultivate, and to devote to agriculture much of the attention formerly bestowed on hunting. Ground is cleared and planted, first with plants grown from shoots, and at a later stage with cereals grown from seed, but the village is still often moved from clearing to clearing. Life is neither wholly nomadic nor wholly settled. Many African tribes illustrate this tendency, particularly those who chiefly grow bananas and edible roots, such as yams and sweet potatoes, and with whom the cultivation of cereals is only beginning.

As free soil becomes scarcer, such tribes are forced to settle, and devote themselves to improving their implements and methods. The best cultivators of the interior of Africa have reached this stage. Their plots are carefully fenced and well tilled, and their villages contain granaries.

When this stage is reached, further progress is easy. The food supply is now steady, and rapidly increasing in quantity and quality. In favourable situations, powerful and wealthy agricultural civilizations grow up and support large populations, like the ancient agricultural civilizations of the Nile, Euphrates,

and Tigris valleys, or the Sudan, India, and China of to-day. Agriculture is held in high esteem, and a very large proportion of the population is actively engaged in raising food. Trade in food-stuffs begins to develop. The society is still, however, a cultivating rather than a trading or manufacturing one. Much of Russia remains at this stage, which survived into the last century in our own country.

The last stage is that through which the coal-producing parts of Europe and the United States are at present passing, and which is just beginning in India, Japan, and China. In our own country the change began about a century and a half ago. The introduction of steam-power led to a rapid growth of manufactures, and changed them from industries carried on by families at home to industries carried on in huge factories grouped together in great industrial towns. The number of consumers who were not food producers, rapidly increased, and the producers were no longer able to grow enough food to supply them. A period of great suffering followed, as imported corn was heavily taxed. When the Corn Laws were repealed towards the middle of the nineteenth century, the importation of foreign wheat immediately increased, and the area of wheat cultivation spread rapidly in the new lands which were being opened up. The same steam-power, which created the demand, now came to the rescue, by rendering transport cheap and rapid. Most of the older agricultural countries are now more or less industrial, and depend for food largely on the new countries, with abundant virgin soil, where industries have not yet developed to any considerable extent.



PRIMITIVE PLOUGHS.

CHAPTER IX.

THE RISE OF THE ARTS.

The Beginning of Invention. By the arts of a race is meant those processes which it has learnt to practise in order to supply itself with weapons, tools, utensils, and other useful objects. When these begin to be made for exchange instead of only for personal use, arts are passing into manufactures. This transition begins early, and is so gradual that no definite line can be drawn between the two.

Man's wants are the first stimulus to invention. His object is utilitarian—that is, he has some useful end in view.

Invention has already begun when the rudest savage first picks up a stone to aim at a bird or beast out of arm's length. In this simple act, so natural as we are accustomed to think it, but really so intelligent, lies the germ of the discovery and perfection of weapons and tools.

Tools and Weapons. At the bottom of the scale of progress come those tribes who live by gathering fruits and roots. Without settled home, sleeping in natural shelters or rude lairs, ever wandering in quest of food, they seem to have contributed little to the list of human inventions. Yet even they possess a simple implement in the digging-stick with which they grub up such roots as they require. Few tribes, however, if any, exist without practising a little hunting in addition.

The hunter of animals cannot succeed without weapons of a higher type than this, and among hunting tribes a great variety of improved weapons is found. Some of these are for bringing down game, others for fighting other hunters who might try to seize the spoil. This is the beginning of a distinction, which afterwards becomes important, between tools and weapons. At first, however, the two are hardly to be distinguished.

For the construction of tools and weapons nature offers various materials. Stone is the commonest. Bone is often used

as a substitute by coast tribes, or by Arctic races who can procure neither wood nor stone. Wood, though more easily worked, is less suitable for tools than stone, nor is it so useful for weapons until considerable skill and ingenuity in design have been acquired.

Stone Weapons and Tools. Stone weapons are found in their simplest form as missiles thrown by hand. Later they are hurled from a sling. At an early stage it occurred to various tribes to use the sharp edge of some stones for cutting, thus making a simple tool. These tools would probably first be grasped by hand. Later they were fitted into handles or shafts, generally by means of splicing. After this discovery tools and weapons rapidly assumed different forms. Knives and axes might be used for either purpose. The distinctive weapons were chiefly spear and arrow heads; the distinctive tools were axes, hammers, adzes, chisels, gimlets, and many others which are indispensable at every stage of civilization.

Stone weapons and tools are found in the oldest remains we know, those of races long extinct and buried beneath the accumulated deposits of centuries. They occur in greater or smaller number and variety among all races which have not yet become acquainted with iron. They develop gradually from rough to perfect forms, the latter often exquisitely polished. Those of backward races like the Australians are very rough, while those of the Pacific islanders are perfect of their kind. The beauty of the splicing on many must be seen to be appreciated, and, before this is possible, a race must have become very skilful in the manufacture of twine. Occasionally, other methods of uniting blade and hilt developed owing to local accidents. Thus, the Californians cemented on their arrow heads with bitumen.

Wooden Weapons and Tools. As soon as stone axes are used, large trees can be felled. Some tribes employ ingenious devices to make this hard work easier. The North American Indians drove in stone chisels with blows from stone hammers, or employed wedges. Wood can no doubt be obtained without the aid of stone tools by means of fire, or after storms. But good wooden weapons cannot well be made until stone tools have reached a considerable stage of development, and, therefore, on the whole, they may be considered as later than stone ones.

Clubs, spears, and similar weapons are the simplest forms of wooden weapons, and can be made without much skill. The bow and arrow requires much more ingenuity and workmanship. It is found almost all over the world, generally with some peculiarity of its own. The bow-string is made of such animal or vegetable fibres as a race can obtain. A list of the various materials employed for the purpose would make us think very highly of the ingenuity shown by very backward tribes in overcoming difficulties.

The finest bows are those of some Pacific islanders, but many South American tribes also make bows of great beauty. The discovery of the guiding feather on arrows has been made by most of the bow-using nations, and marks a very great advance.

Wood is too soft and blunt to be of much use for tools, but its comparative lightness makes it very suitable for shafts and handles.

Metal Weapons and Tools. A further stage is reached when iron or some other metal is substituted for stone. Races which have learned the use of metal, are said to have passed from the Stone Age to the Copper or Iron Age. Hammering generally comes before smelting. The North American Indians knew how to hammer copper, but not to smelt it, and were quite ignorant of iron working. The use of iron is known to most African tribes except the Bushmen, and most negro tribes are excellent metal workers. Some tribes otherwise advanced, like the Pacific islanders, have no knowledge of metal working. Metals are, of course, not found on coral islands, and in the Pacific they are rare on the volcanic islands also. The use of iron was, however, known in New Guinea, whither it was probably introduced by Malays. The Malays are excellent smiths, and make many curious and beautiful metal weapons, like the terrible curved and straight kris or dagger. The Hindus are perhaps even more skilful, and every village has its smith. The Indian metal weapons include many strange and horrible forms. Among the older civilized races metal working has been long known and carried to great perfection, some nations, like the Malays and Hindus, devoting more attention to highly finished and delicate work, others, like most European nations, to strong and massive construction.

Iron weapons and tools are now everywhere being introduced by traders, and are eagerly sought by most stone-using tribes.

In addition to wood, stone, and iron, some accidental circumstance may lead to the adoption of a special material in a particular district. Many tribes of Indians make arrow heads of the glass of the whisky bottles introduced by the white man, and some do a large trade in them. In this readiness to adopt any suitable material we have a living picture of the way in which different improvements have been made in the course of ages.

Fire-arms. The last great change in the character of weapons was made by the introduction of gunpowder. The new weapons are far more deadly than the old, and are coming into world-wide use. The first thing most savage tribes borrow from civilization is the use of fire-arms, and in all probability native weapons will soon be things of the past.

Fire. Without tools or weapons of some kind, a race would perish of starvation or be destroyed by wild beasts. Without fire, life would be equally impossible, except in the most favoured climates, and then only under the rudest conditions. The discovery of fire is one of the great landmarks in the history of the world.

The simplest method of obtaining fire is by friction. This is widely practised, in rather different ways, in many parts of the world. Some Malay tribes rub split bamboo together. The Polynesians make one stick drive a groove along another placed beneath it. A sort of firedrill is used by Bushmen and other tribes. The Eskimo improve on this method by fastening a cord round the drilling stick to make it rotate more rapidly. All these methods quickly produce fire in experienced hands, though we ourselves fail completely if we attempt them. Success depends partly on the choice of wood, and still more on the possession of a knack which savages readily acquire by practice, but which we have lost.

The next method is by striking a spark into dry tinder. The Fuegians strike sparks with flint flakes from lumps of iron pyrites into the down of birds, and blow them into a flame. A method of a similar kind, generally known as that of flint and steel, remained in use among ourselves until little more than half a century ago, and tinder was regularly prepared in every house for lighting the fires the following morning.

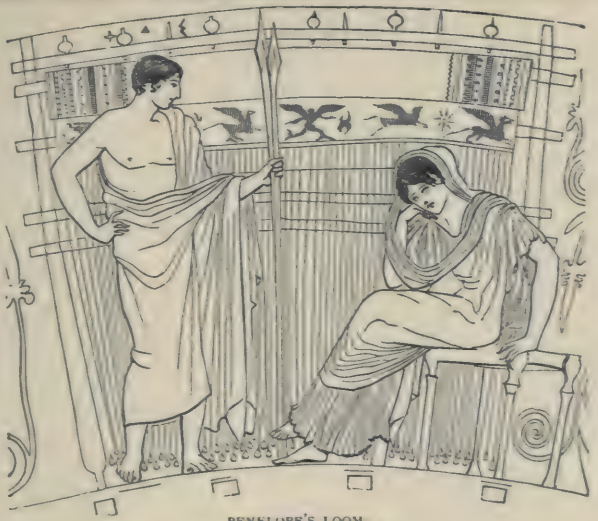
The most modern method of making fire is by striking matches containing some inflammable substance on a rough surface. A recent traveller in Africa remarks that it is now

difficult to find a tribe which still uses fire sticks. When a white man visits a tribe for the first time, he finds that in some mysterious way the European lucifer matches have got there before him.

Fire and the development of Utensils. The discovery of fire introduced, or rather satisfied, a new set of wants. Man has been described as a cooking animal. It is true that many tribes devour meat raw and rotten, but, nevertheless, the desire to render food more palatable by cooking has played a large part in the improvement of utensils.

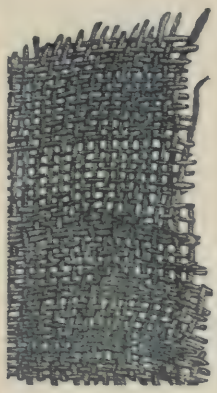
For utensils a great variety of materials are suitable. Shells of suitable shape are used by coast tribes. The shells of the coco-nut and gourd naturally suggest receptacles, and are used as such wherever they grow. The bamboo serves the same purpose. The Bushmen carry water in the shells of ostrich eggs, fastened with grass stoppers. Where animals are kept, the bladders of animals are used, as among the Lapps, and bottles of hide, as among most pastoral peoples. As these collapse and take little room when empty, they are well suited to the herdsman's wandering life. The North American Indians and many African tribes plait water-tight vessels, which are often coated with resin. Wooden vessels of very good workmanship are made by tribes too numerous to mention. None of these are fire-proof, and few are adapted for cooking, at any rate over an open fire.

The discovery of pottery is often taken to imply a very high state of progress, and this is perhaps true. We must not, however, assume that its absence means a low stage of civilization, for it is not known to many very advanced races of Pacific islanders. Their mode of boiling water is by dropping in stones made red hot in the fire, and for this their coco-nut and wooden vessels do perfectly well. But none of the most backward races have discovered the art. It is unknown to Australians, Bushmen and Fuegians, and for obvious reasons to Eskimo and other northern tribes. The Hottentots make clay vessels which are sun dried and fired. The negroes are expert potters, and the art is universal among the Malays, though their pottery is not well fired and is therefore too soft. It was known to the Indians of both North and South America, who, in many cases, produced excellent specimens, glazed by various processes. The potter's wheel was known to the ancient



PENELOPE'S LOOM.

MEDIÆVAL LOW-WARP LOOM.



PREHISTORIC (STONE AGE) FLAXEN STUFF.

Egyptians, but it is unknown to a great number of the pottery making races of the present day.

Metal vessels naturally become important among tribes which understand metal working. They are not only fire-proof, but far more durable than any others.

Arts connected with Food. The drying, salting, and smoking of meat, and the preparation of fermented drinks are other arts which have been almost universally discovered in connection with the preparation of food. Tobacco smoking leads to the making of pipes, often of great neatness, and may thus improve the general standard of skill among a race.

Arts connected with Clothing. Another group of arts has sprung up in connection with clothing. The African or the native of tropical America may, indeed, go nearly naked, but in colder climates some covering is a necessity.

The simplest material is unplaited grass or reeds, but this is suitable only for a tropical climate.

The skins of animals are a very abundant material, among both hunting and pastoral peoples. Among rude tribes, the skins are simply girt round the figure. Among more civilized races, or under more severe conditions of climate, neat articles of dress are fashioned, like the mocassins of the Red-skin, and the fur garments of the Eskimo. A large section of the human race has therefore learned various methods of dressing skins, though only the most advanced tan with bark. The skin is generally scraped with bone, shell, stone, or iron tools, according to what a tribe possesses, and dressed with some astringent substance. Among the Eskimo, skins are chewed, bit by bit, by the women to make them soft.

Along with this goes the development of sewing. Animal sinews are generally used as thread. The Eskimo and some Alaskan tribes are remarkable for their exquisite sewing.

Skins are not always to be obtained, and in some parts of the world they are too hot. Many races in hot climates are dressed in bark cloth, which is almost universally used in the Pacific, and very largely in Central Africa. So suitable is this material to the needs of these races that it has delayed the advance to spinning and weaving.

Plaiting is another widely spread art. Most of the tribes who use bark cloth, plait shreds of it. Grass, reeds, and various other fibres, are often so finely and skilfully plaited as

to defy all civilized imitations. Extraordinarily beautiful work of the kind is done in the Pacific islands, that of the Solomon islanders being perhaps the most exquisite. For coarser purposes, coco-nut fibre is used, as, for example, for mats, floor cloths, and hangings. Girdles, bags, baskets, string, cables and nets, fans, pouches, and excellent sails are all made in the same way. Even Australian tribes make nets and baskets, while the Hottentots, in addition to plaiting nets of mimosa fibres, weave excellent mats of reeds and rushes. The nettle-fibre cloth made by the Ostyak women is among the articles taken by Russian traders.

Spinning and weaving rank very high among the processes by which man adapts raw materials to his use. They were known to, but not universal among, the North American Indians, and were very common in South America. The Malay tribes use a simple loom, but the process is slow. Weaving is highly developed among the negro tribes of Africa, who grow and manufacture cotton. It has long been practised by Japanese, Chinese, Hindus, and other advanced races.

Arts connected with the Need of Shelter. The development of shelters from temporary huts to permanent dwellings has already been traced. Each stage means a corresponding progress in such arts as carpentering, joinery, brick-making, building, etc., up to the most modern developments of sanitary and electrical engineering.

Thus, many of the commoner arts have grown up round the most simple needs of man, food, and clothing and shelter. Different occupations have also played their part by leading different groups to pay special attention to this or that art.

The Arts of Hunters. Hunting people possess the fewest arts, but their weapons are usually excellent. The Australian has spears, axes, and clubs, of coarse and heavy construction. This, of course, implies that he possesses rude stone or shell implements with which to fashion them. He has originated the boomerang, an ingenious curved weapon, which travels in an ellipse and returns almost to the thrower's feet. The Bushmen make neat bows with strings of twisted sinews. The Hottentots prefer assegais or javelins, as do many of the African tribes. The Eskimo have produced the harpoon, a perfect weapon for its purpose, and not only ingenious in design, but elegant in construction. Many hunting tribes use

poisoned arrows and the preparation of these vegetable poisons is one of the most important of their arts.

The Arts of Fishers. Fishing races devote most of their powers of invention to improving their nets, lines, hooks, and boats. All know how to plait nets of animal or vegetable fibres. The Eskimo understand the use of inflated bladders for towing purposes.

The Pacific islanders and Malay tribes are among the most expert fishing races in the world. All make excellent ropes and fish-hooks. The fish-hooks of the Pacific islanders, more especially of the Solomon islanders, are considered, even by Europeans, as superior to any of European manufacture. They are made of bone, tortoise shell, sea shell, or hard wood, very skilfully spliced with the finest twine.

The boat receives even more attention. Very simple canoes can be made by cutting down a tree and hollowing it. Among many wandering Brazilian tribes this is all that is done, and the dug-out, as this canoe is called, is abandoned as soon as the river is crossed. The same method is used by the natives of New South Wales. Such canoes may become neat and elegant in construction if the inside is hollowed out by fire, and the work completed with any tools at the disposal of the builder.

Bark canoes are used by Australian and Fuegian natives, and buffalo-hide canoes were used by many North American Indian tribes. The Eskimo has brought this type of canoe to perfection in his kayak, a light, almost indestructible, boat, made to fit the kayakman like a part of his dress, and so light that it can easily be carried on the head for miles. The frame-work is of walrus tusk, the covering of skins.

The outrigger appears to be known to the Australian natives of Cape York. The outrigger canoes of the Malays and Polynesians are of great excellence, and the finely plaited sails are fully worthy of them. Both canoes and paddles are often richly carved and ornamented. Boat-building is a special trade in the hands of professionals.

The Arts of Pastoral Races. Pastoral races devote special attention to making durable materials from the hair and wool of their flocks. Kurd rugs, Persian rugs, Turkey carpets are all familiar. The preparation of leather for saddles, bridles, utensils, and tent coverings, and of felt for the latter purpose, are arts of the highest importance.

FIJI CANOE UNDER SAIL.

The Arts of Agricultural Races. Agricultural races first modify their agricultural implements, but all manufactures develop so rapidly when a race settles, that it is impossible even to mention the names of all that are practised. The need for improved implements stimulates all branches of the smith's trade. The abundant supply of textile fibres gives an impetus to weaving. New processes, such as that of extracting oil from the various products grown, are discovered, creating a demand for new utensils of every kind. The household amasses property of various kinds, and, in its settled form, is able to satisfy each new requirement. Furniture becomes an important possession. Thus, in ways too numerous to mention the trades practised by settled societies grow from year to year.

The Aesthetic Arts. So far we have considered progress to be chiefly directed towards utilitarian ends. There is, however, another principle which has had a considerable influence on the development of arts and manufactures. Men early show a love of what they think beautiful, although it may serve no useful purpose at all. This is what is called the aesthetic influence. It appears in many forms. In its simplest form, it is a desire to decorate the person either by painting, tattooing, scarifying, or otherwise calling attention to particular features. The next stage is reached when ornament is applied to various useful articles. Still another form is seen in the construction of musical instruments, which are found among the Hottentots, by no means an advanced race.

It is possible that much ornament originally had a utilitarian end in view. Articles may have been decorated to enable a man to identify his own. The beautiful plaited bands on some Polynesian clubs may give a better grip. But, after making all allowances, it seems that much is prompted wholly by the love of beauty.

Only the decoration of useful or ornamental objects has had any considerable influence on manufactures. Patterns are introduced into ornamental plaiting; tapa and other cloths are printed or dyed with fancy patterns; paddles and clubs are elaborately carved. Each of these grows in time into a special trade. Exquisite feather garments are made for festival use by some South American tribes. The mother-of-pearl inlay of some Pacific islanders is very skilful and beautiful, and the

ornamental metal work of the Malays ranks high. Among the decorative arts embroidery holds a high place, and in one of its highest forms becomes the manufacture of tapestry. In its germ it is perhaps found among those tribes who, like the Samoyads and Tunguses, love to ornament their fur garments with bands of brilliantly coloured stuff. The Japanese, Chinese, and Hindus, and other eastern peoples seem to excel in every art or manufacture they attempt, and to possess a natural artistic skill far beyond anything known to European craftsmen.

AN EARLY POTTER'S WHEEL.

CHAPTER X.

DEVELOPMENT OF MANUFACTURES.

Division of Labour. When one particular kind of work is always done by one particular set of people, division of labour is said to be practised. A familiar example of this in daily life is that men go out to work, while women stay at home to look after the house and children. This is division of labour between the sexes. Again, our proverb, "Jack of all trades, master of none," expresses in a homely way that it is a better plan, say, for the blacksmith to make shoes for the baker's horse, and for the baker to make bread for the smith's family, than for the smith to make his own bread, and the baker his own horse shoes. Much time is saved by such division of labour, and each man becomes a better craftsman through constant practise.

Division of labour between the sexes. Among backward societies such division of labour as exists is chiefly between the sexes. Men get the living, women look after the home. In general terms, men do professional, women domestic work.

Men's professional work generally takes them much from home, especially when it is an occupation like fishing or hunting. Women's domestic work, on the other hand, keeps them much at home, whether that home be a rude movable hut or a modern English house. In all stages of society women are more sedentary than men.

The sedentary character of women has a great influence on the early development of arts. It is they who first feel the need of this or that convenience, and try to supply it. In this way they begin not merely agriculture, but such arts as pottery, plaiting, weaving, and spinning.

At an early stage, the various arts are almost entirely connected either with the man's professional work or the woman's domestic work. This leads to the next stage in the division of

labour. The domestic arts, especially those connected with the preparation of food, clothing, and utensils, are left to women. The men devote themselves to such arts as the construction of tools, weapons, boats, fishing tackle, etc. A good example is found among the Eskimo, where the women spend their winters in preparing furs for clothing, and the men in making harpoons and kayaks.

As societies become more complex, men take over more and more occupations formerly practised by women, and become cultivators, potters, weavers, etc. At a very late stage, they even engage in the higher branches of cooking and dress-making, the oldest of women's occupations.

A little thought will generally show the advantage of most kinds of division of labour between the sexes. At first sight, it seems hard that the Bushman's wife should be loaded both with her infants and such household goods as require carrying. But the husband must be free to pursue game with all possible speed, which he could not do if similarly encumbered. So, the wives of hunters, like the Samoyads and Ostyaks, strike and erect the tent at each move. This enables the men to start earlier and return later than they could do if these duties fell to them.

Division of Labour between Classes. As soon as men begin to practise arts, division of labour rapidly increases. All the men do not work at all the arts considered as men's work. One set of men practises one art to the exclusion of others. This is largely a consequence of the unequal distribution of raw materials. Thus an Australian tribe in one district makes mats, while a tribe in another district makes weapons. These are then exchanged. Otherwise one tribe would find it difficult to get mats, and the other to get weapons.

Rise of Manufacturing Classes. Among all races except the most backward, division of labour has proceeded far enough to create not merely special manufacturing tribes, but special manufacturing classes within a single tribe. Thus, among the North American Indians, arrows and spear heads were made by skilled workmen in each tribe. The best material was obsidian, which was not found everywhere, and obsidian arrow-heads were made only in one or two tribes.

Considerable division of labour is also practised by the negro tribes, who have attained a high degree of skill in many

arts. Ironwork, boat building, fishing, and different kinds of hunting, particularly hippopotamus hunting, are all special trades. Pottery is still generally left to women.

Division of labour has gone as far, or further, among the natives of the Pacific Islands. The most important trades, those connected with seafaring, are all left to experts, who are held in the highest esteem. Boat building is peculiarly a skilled art. In Tonga and Samoa carpenters are ranked as high as priests. In Hawaii there are not merely boat builders, but boat carvers too. Net making is another special trade, and so are building, roofing, and the making of armour.

In India, which stands at a still higher level, every village has its smith, weaver, potter, oil miller, etc. Many manufactures in that country long ago reached a very high stage, and were highly valued articles of trade. The name 'calico, reminds us of the antiquity of the cotton manufacture at Calicut. Many of the finest fabrics are no longer made there.

Rise of Manufacturing Localities. As manufactures grow, they tend to become of superior excellence in different localities. This depends on many causes, the distribution of raw material, special demand, hereditary skill. Thus, in the Pacific Islands, the fish-hooks of certain islands, *e.g.* the Solomon Islands, are very fine indeed, as are also canoes, wooden dishes and other articles. The New Hebrides make especially good weapons. The mats differ considerably, and a native connoisseur can tell from what island a particular specimen came. So again in Malaysia we find true manufacturing centres. Thus, Nagara, in Borneo, manufactures weapons and pottery, and excels in shipbuilding and mat weaving. The silks of China, the pottery of Japan, Benares brass, Turkey carpets, all, in this way, become articles of special demand.

Unskilled Labour. An interesting form of division of labour arises in a somewhat different way, and becomes more important at a later stage of development. Thus, on the Asiatic tundra, the Tunguses, who are among the poorest of the native tribes, like to live near the Chukchi who have large herds of reindeer. They are employed by them as reindeer drivers, and thus make a better living than they could otherwise do. In South America many Indians have long made a living by acting as porters and carriers over the Andes. This has become a regular occupation since the white colonization. In Japan

there is the same readiness, too, among the poorer classes to hire themselves as beasts of burden. This brings us to a state of society where, instead of working at some occupation for their own benefit, men sell their physical strength to those who will buy it, just as they would sell any other commodity. These are usually called unskilled labourers.

Grades of Manufacturing Societies. We have now traced the development of manufactures through various stages,—from the first attempt of the lowest tribes to improve their chances of obtaining a living, through the gradual discovery of the various arts of life, and the introduction of division of labour, first between the sexes and then between different classes of the community,—to the growth of manufacturing societies making a speciality of products of different kinds. In a highly complex society we find very varied and highly developed manufactures carried on by skilled workmen, while a residuum of the workers sell their unskilled labour for what it will fetch.

Distribution of Manufactures. We have now to consider what causes lead to the growth of this or that manufacture in a particular place.

The Distribution of Raw Material. The first factor is the distribution of raw material. This is particularly important in new countries and among simple races. In simple societies a manufacture is impossible except where the raw material exists. In complex societies, where transport has been brought to great perfection, the absence of the raw material only makes its manufacture dearer, as the cost of transport has to be added to the cost of manufacturing.

Examples of the relation between a local manufacture and the distribution of raw material are so numerous that only a few typical ones can be given. In a country like Canada the industries are chiefly connected with timber. This country is fortunately excellently provided with natural waterways, so that timber can be floated down at small expense. The same water power can be utilized to turn saw and other mills. Saw-milling, ship-building, barrel-making, furniture-making, suggest themselves as industries likely to be carried on in the towns. Since wood pulp has been employed in paper-making, two new industries have been added to the list. In Norway, another country which combines abundance of timber with good water-power, match-making, tar-making, and charcoal-burning are

other industries connected with the forest produce. In the Black Forest and in the valleys in the Swiss forests, wood-carving, clock-making, and toy-making, prove profitable means of employing the abundant timber and the enforced leisure of the long winter nights. In a new country, where population is thin and labour scarce, these would hardly find a market on the spot or pay the cost of transport to a distance.

The mountains of temperate lands are generally forested, and the scene of forest industries. Minerals also are often abundant in their rocks, and mining is a most important industry in many mountain districts. The timber then proves of great value for smelting purposes, as in Dannemora and other Swedish iron districts, in the Urals, and formerly on the Weald in this country.

On the coasts the raw material consists of fish. This is exceedingly perishable, and where large markets are not to be found near, much is dried, salted, or canned to preserve it during transit. Fish-curing is important all round the coasts of our own country, and some towns have a special reputation for it. Yarmouth "bloaters," Loch Fyne "kippers," Aberdeen and Findon "haddies," and Arbroath "smokies" are among the best known. Norway smokes much fish, principally cod, salmon, herring, and sprats, and also prepares large quantities of oil from the livers of cod. This is a regular industry in the Loffodens and other fishing centres annually visited by Norwegian fishermen. In the Mediterranean, anchovies and sardines are the chief fish preserved. On the coast of British Columbia and in the New England fishing towns large quantities of lobster, salmon, and oysters are preserved by canning.

All along any coast, boat and ship-building may become important if timber is readily obtainable.

In the same way, various manufactures grow up round various agricultural products. The vine-growing districts, *e.g.* the south of France and Germany, Spain, Italy, California, some parts of Australia and Cape Colony, are all engaged in the manufacture of wine and vinegar. Oil is pressed from the olive where this is grown, as in France and Italy. In other southern European countries much perishable fruit is dried to secure its better preservation for the market. In great wheat-growing districts flour-milling is important, as in towns like Minneapolis, which receives the produce of the western prairies. The silk

manufacture is carried on where mulberries and other suitable trees can be grown as food for the silk worms. Japan and China in Eastern Asia, the Po valley in Italy, and the Rhone valley in France are important centres.

The woollen manufacture develops first where there is good pasture. Thus, it has long been carried on in the south of Scotland, Yorkshire, and the west of England, all near to good sheep pastures. That it depends on other conditions also is shown by the fact that Australia and other young sheep-rearing countries export their wool instead of manufacturing it.

As a general rule, we may say that the distribution of raw materials has more influence on the rise of manufactures in new countries than in old. In both, local industries arise wherever the raw material is very perishable, like fish or grapes, or of too small value to pay for transport, like clay for bricks or pottery. Raw material which does not spoil in transport and is sufficiently valuable to pay for it, is more often exported from new to old countries than manufactured on the spot. But there is a growing number of exceptions to this rule.

Power. The second circumstance which has great influence on the rise of manufactures in particular districts and towns is the kind of power used.

Hand Power. At first all manufactures are carried on by hand power. This is a slow and laborious process. Up to the beginning of the nineteenth century, hand weaving (including the use of treadles) was still carried on in many parts of this country. Those who have read George Eliot's *Silas Marner*, or Barrie's sketches of Thrums, can easily form an idea of the conditions under which the English and Scottish hand-loom weavers worked. Instead of great and busy manufacturing towns, there were a number of small centres, as one place was as suitable as another, provided the raw material could be obtained.

Water Power. The next stage began when water power was used to drive machinery. Under these changed circumstances the manufacturing population began to gather near to running water, and to remove from places where this was not to be had. Rapid hill torrents supply more power than sluggish streams winding across a plain. It is common in many parts of Scotland to see old mills near torrents of this kind, in the midst of comparatively lonely country.

In the case of the woollen manufacture, the same district frequently supplied wool from the sheep pastured on the hill sides, and excellent water power in the valleys from the hill streams. This explains why the woollen manufacture arose in towns like Hawick and Galashiels in the Tweed valley. In Yorkshire the Pennines and Wolds, and in the West of England the Cotswolds, similarly supplied both wool and water power, and both, therefore, became woollen centres. Other examples will readily suggest themselves, but these are typical ones.

It has been said that hill torrents give more abundant power than sluggish rivers winding over a plain. But power is not everything. Where raw material, like wool, is produced in the immediate neighbourhood, other considerations do not, perhaps, count for much. But where the raw material is brought from a distance, a navigable river, and especially an estuary, offers to the towns on its banks great advantages for obtaining raw material, and for cheaply distributing its manufactured goods. Rivers like the Tweed thus possess one set of advantages but lack others, and, in such a case, an industry is less secure than if both were combined.

This facility of transport makes all great rivers tend to become the seats of large manufacturing centres. The Mersey brings Liverpool and the cotton manufacturing towns of Lancashire into communication with the cotton growing States of America. The Clyde does the same for Glasgow, and also makes a magnificent outlet for the ships built in the Clyde shipbuilding yards as well as for the goods manufactured in the various industrial towns in the neighbourhood. What the Mersey does for South Lancashire, the Clyde for the manufacturing district round Glasgow, and the Thames for London, the Seine does for Rouen and the Rhine for Westphalia.

Steam Power. The next change in the distribution of manufactures arose out of the substitution of steam for water power.

Just as the introduction of water power attracted manufactures towards the rivers, so the introduction of steam power attracted them towards coalfields. One of the first results of the use of steam for driving machinery was the rapid development of steam locomotion by rail on land, and of steam navigation by sea. It is now an easy matter to bring raw material to coal. During the greater part of the nineteenth

century this circumstance had a great influence on the prosperity of manufacturing districts, causing the rise of some and the decline of others. Districts where coal was abundant have usually developed, though raw material might have to be brought from a great distance. Where coal was lacking, a district usually failed to compete successfully with others better supplied.

Distance from raw material is thus becoming less important at the present time, owing to the cheapness of transport, especially by sea. Iron is brought from Sweden and Spain to be smelted in the blast furnaces of our coalfields, and copper is brought from remote Chile to the furnaces of Swansea in South Wales. Cotton comes across the Atlantic to the Lancashire coalfield, with its highly suitable port of Liverpool, and the Australian farmers send their wool to be woven in the home markets.

The last century saw the rise of great manufacturing towns, with large industrial populations crowded into factories where powerful machinery is driven by steam. These centres are naturally on the coalfields. The South Lancashire coalfield, with the great cotton manufacturing towns, Stockport, Bury, Bolton, Burnley, Preston, etc., is really one great town, with Manchester as its centre, and Manchester and Liverpool as its ports, with a population of about 4 millions. The Yorkshire woollen manufacture, which owed its rise to quite other circumstances, has developed enormously owing to the fortunate circumstance that the Yorkshire coalfield supplied fuel for the modern processes. The woollen manufacturing districts of Tweedside and the West of England, which do not possess this advantage in the same degree, and where water power is still largely used, have not developed at the same rate.

Where iron occurs in combination with coal this leads to a rapid increase in the number of industries and the density of population in a particular manufacturing district. Owing to the combination of coal and iron, the machinery required in the various manufactures and locomotives for the enormous traffic in raw material and manufactured goods can be made on the spot. Thus, the iron manufacture is very important on the Lanarkshire coalfield, where iron is found. Here machinery of all kinds, including locomotives, is made in and around Glasgow. Most of the machinery for the cotton towns is made

in Oldham, Rochdale, Bury, and the surrounding ring of towns. On the Yorkshire coalfield, Keighley and Bradford supply machinery for the local woollen manufacture. Sheffield manufactures every sort of iron and steel goods, from needles to the most massive iron-clad armour plates. The building of iron-clads and the manufacture of ammunition are typical of the Northumberland and Durham coalfield, and much smelting is done on the South Wales coalfield. The Midland coal and iron fields support a vast iron industry in which Birmingham, Wolverhampton, Walsall, and the surrounding towns are busily engaged. This district is known as the Black Country, a name which well describes its unlovely landscape of smoking chimneys, belching furnaces, coal shafts, pit banks, and gloomy smoky towns, whose foul air kills the vegetation for miles around. Like South Lancashire, it is really one vast industrial town.

In Britain, France, Germany, Belgium, and the Eastern United States, where population is dense and labour abundant, the presence of a coalfield everywhere leads to the growth of an important manufacturing district around it.

The coalfields of many countries are not yet used for industrial purposes, but the process is already beginning. As the domestic consumption is very small in a hot country, all the coal in India is available for industrial purposes. China also possesses virgin coalfields and abundant raw material. The coalfields of the Rocky Mountains already supply fuel for the Canadian Pacific railway, and are beginning to be used for smelting the minerals which abound in the Rockies. Manufactures will doubtless develop as the Western United States and Canada become more thickly settled.

Electric Power. The end of the nineteenth century witnessed another change which will greatly affect the distribution of manufactures in the twentieth century. This is the introduction of electricity, which is most cheaply generated by water power. Just as coal attracted industry to the coalfields, so the introduction of electric power will attract industry back to the sources of water power.

It is a striking sight in the Bernese Oberland, under the virgin snows of the Jungfrau, to see the electric lights of the great hotels of Mürren shine out amid the stillness and loneliness of the upper Alps. The electric light is generated

by the streams and falls fed by the glaciers of the snow giants around. The secluded towns and villages of the Black Forest or of the Norwegian fiords make a similar use of their water-falls and mountain streams, as do some of our Highland towns, *e.g.* Fort William. This example of the most recent application of science to industrial purposes is the more striking from its contrast with the wild loneliness of the natural surroundings. That the Chaudière Falls should light the city of Ottawa and drive its electric cars seems natural enough in a large and rapidly growing city. The same power can be applied to its manufactures, which have, therefore, every chance of rapid development. East of the Appalachians a line of falls, where the rivers flow from the harder old land to the softer young coastal plain, has led to the rapid growth of a series of manufacturing towns, which make an increasing use of the neighbouring water power to generate electricity for industrial purposes. Trenton is built at the falls of the Delaware, Philadelphia at those of the Schuylkill. Cotton manufacture is rapidly becoming important in the southern towns near the cotton-fields, such as Augusta.

The cataracts of the Nile will probably be used to generate electricity for transport, lighting, and general industrial purposes. One of the greatest sources of electric power in the world will eventually be Niagara Falls. Since it has been found possible to transmit electric power for long distances, there is hardly any limit to the possibilities which the unused power of Niagara represents. At present all the electricity used in Buffalo is generated from the Falls, but it represents only a fraction of what is available. The twentieth century will probably see an enormous development of manufacturing prosperity in the towns on the adjoining Lakes, which, in addition, possess the most admirable facilities for water transport in the world.

Labour. There is still another circumstance which contributes towards the successful development of any manufacture. That is the supply of labour. The absence of labour is the chief reason why new countries cannot engage successfully in manufactures. They may possess raw material, coal, excellent water power for developing electricity, navigable rivers for bringing down manufactured goods to the sea, and good ports for receiving steamers to carry them to foreign markets.

but if labour is scarce and dear, these advantages count for relatively little.

The problem of procuring labour is an old one. It has, no doubt, always been one of the chief causes of slavery, which has existed for thousands of years as a domestic institution. The slave traffic became a regular institution and a flourishing branch of trade after the colonization of America by white men led to a demand for labourers capable of supporting tropical conditions. The native Indian races of America have little stamina. Negroes, whose capacity has already frequently been noticed, were imported for plantation labour. This solved the problem so far as production was concerned. The same difficulty was experienced with regard to manufactures, and consequently the bulk of the cotton was exported.

The industrial development of South America has similarly been greatly retarded. Australia suffers in the same way, and at the present time Polynesian labourers are largely imported—under a system of engagements which is not so perfect as could be wished. South Africa has also its labour problem.

The Chinese have spread widely in response to the demand for labour. There can be no doubt that China has a great future as a manufacturing country, for it combines almost every natural advantage with a dense population of industrious and highly skilled labourers. Japan has already been enabled by its good supply of cheap and efficient labour to compete with Europe in many manufactures. India, though its native labour is not so good, will also play its part as one of the manufacturing countries of the world. Indeed, the competition of the Indian cotton manufacture is already felt by Lancashire.

Other Circumstances. In addition to these, there are sometimes local causes which make a particular manufacture important in a particular place. Thus, the air of Ulster contains exactly the right amount of moisture for the successful manufacture of linen, which is largely carried on in Belfast and the neighbourhood. The water of certain towns is particularly suitable for brewing beer, as Edinburgh and Burton-on-Trent. Some rivers have water particularly suitable for bleaching, like the Lys in Belgium.

Examples. In most cases, a great manufacturing town possesses not merely one but a combination of advantages,

and a comparison of its manufactures with its geographical position will generally, after a little thought, enable us to see the reasons why this or that manufacture has developed there. For example, Belfast, which possesses special climatic advantages for the linen manufacture, is fortunately a port, and a port situated right opposite to the Ayrshire and Cumberland coalfields, so that fuel is easily obtained. Minneapolis might not be a great flour-milling town but for the available water power from the falls of Saint Anthony.

The town of Cleveland, in Ohio, combines several advantages which fit it to be the centre of a great iron industry. It easily obtains coal from the Pennsylvania coalfield, iron ore from Lake Superior, and lime, for reducing the iron, from the islands in Lake Erie. Its position on Lake Erie gives it, in addition, one of the finest situations in the world for water transport and communication.

Pittsburg and Allegheny City in Pennsylvania are situated on the navigable Allegheny river, a tributary of the Ohio, in a coal and iron region which also yields natural gas.

Montreal, since the deepening of the St. Lawrence, is another example of a manufacturing city which combines great advantages for obtaining raw material with equal facilities for manufacturing and distributing its goods. The Great Lakes and the system of canals connected with them bring all the raw material of the interior into its factories. Its magnificent river, navigable for large ocean steamers, brings the produce of other lands and immigrant labour. It obtains coal from coalfields to west, south, and east, with which it is connected by river and canal, lake and sea. Abundant water power is available. The advantages of situation which it possesses for obtaining raw material are equally suitable for distributing its finished goods.

CHAPTER XI.

TRADE AND TRANSPORT. TRADE ROUTES AND TOWNS.

Rise of Trade. Trade begins with the attempt of men to obtain something they have not in exchange for something of which they have more than enough. For example, pyrites for making fire is a necessity of life to the Fuegians. It is only found in particular localities. Consequently a trade in pyrites springs up between the natives of districts which produce it and the natives of districts where it is not found.

Trade depends on two things; the unequal distribution of commodities in different parts of the world, and the existence of facilities for transport.

The Unequal Distribution of Commodities. Every part of the world has its own special products. If we take Europe as an example, we find that Russia produces large quantities of wheat, timber, hides and tallow, from its forests, arable and steppe lands. Norway obtains timber from its forests, and fish from its seas. Sweden adds iron and other ores from its rich mines. Holland and Denmark devote themselves to dairy farming. Germany and Northern France produce beet-sugar, hemp, cereals, and wines. The Mediterranean lands produce wine, oil, silk, honey, and fruits. Our own country and Belgium are rich in minerals.

Asia produces furs from the northern forests, wheat on the Siberian plains, tea, rice, sugar, spices, pearls, and tropical produce of many kinds in the south. Africa is rich in ivory, palm oil, rubber, ostrich feathers, and many other commodities.

These are but samples of the many articles which different parts of the world have to offer for exchange.

Manufactured articles present a similar variety. Many eastern countries make curious and rare fabrics, fine metal work, and curiosities of all descriptions. Chinese ivory carvings and silks, Japanese lacquer and porcelain, Indian metal

work, Persian carpets, and Oriental embroideries are of world-wide fame. The manufacturing countries of Europe and America devote more attention to use than beauty, and produce innumerable serviceable articles at a low price.

Trade among Typical Societies. Before the introduction of agriculture and manufactures, a country or tribe has little to offer for exchange. In return for a lump of pyrites the Fuegian can offer only fish or a weapon. Hunting tribes like the Congo Pygmies obtain bananas and other cultivated fruits from their agricultural neighbours in exchange for the produce of the chase. A considerable trade is early carried on in weapons, for the making of which particular districts afford particular facilities.

On the tundra, we have a hunting and fishing people trading among themselves and with their agricultural and manufacturing neighbours, the Russians. The local trade is in reindeer and weapons. The Russian trade is carried on at fairs and periodical markets. The nomads bring skins, furs, stags' horns and other produce of the chase, fur boots and the nettle cloth made by their women. In return, they obtain vodka, an intoxicating drink, tobacco, tea, sugar, flour, firearms, and powder, utensils and manufactured goods—those articles, in fact, which they cannot obtain by the chase of animals or the capture of fish. By satisfying these needs the Russian traders obtain possession of the valuable furs which are in demand in Russia and in most of the northern countries of Europe. The Eskimo and other Polar tribes of North America have very similar trade relations. Iron has been introduced by way of Hudson Bay and the Great Lakes. In Alaska firearms are in every hut. Tobacco had been introduced from Asia across Bering Strait before the coming of the Europeans. The native trade is, of course, chiefly in furs.

On the Asiatic steppes the trade is carried on with China on the east and with Russia on the west. The wealth of the nomad herdsmen consists of hides, tallow, and other produce of their flocks and herds. They lack tea, which is in great demand, opium, flour, woven clothing, and firearms. Formerly, in addition to the exchange trade in these articles, there was a large caravan trade across the steppes, by which Chinese wares were transported to Europe. Now, more and more commodities are consigned direct to European ports and the caravan trade is

falling off. So long as it continues, the providing of relays of pack animals will be an important element in the trade of the steppes.

The African desert has little to offer for exchange except the date. The most mportant trade is the through caravan traffic, which requires relays of camels and camel drivers. Ivory, ostrich feathers, gums, spices, musk, gold dust, indigo, cotton and palm oil are among the products thus transported. In Central Africa slave raiding was an important branch of trade. At centres like Ujiji there were permanent markets where every sort of African produce, from an earthenware pot to a choice slave, could be purchased. Local markets are frequently held and enable fishing, hunting, agricultural and manufacturing tribes to exchange their wares. Natives come long distances to attend them, for bargaining is a passion with the negro. Many European wares are put into circulation at these markets, so that, as already mentioned, white explorers occasionally find that European articles have reached a spot before them.

The forests of the world trade in timber and other forest produce. The Siberian forest is rich in furs. Canada, in addition, supplies timber and fish from the forest region. In the South American forest native tribes collect rubber, sarsaparilla, resins and gums, fancy woods like mahogany, and many other commodities of economic value. The trade is chiefly carried on by water. Traders visit the interior periodically and obtain from the native collectors the articles for which they have contracted and often paid beforehand. Axes, cutlasses, knives, fishhooks, salt, mirrors, and some kinds of cloth are examples of the sort of merchandise in demand among the native tribes.

The Trade of Manufacturing Countries is much more complex. They have an innumerable number of commodities to offer for exchange, many of them made for the express purpose. They import raw materials to supply their manufactures, food to feed their dense populations, and luxuries. These branches of trade probably developed in the following order; trade in luxuries, trade in raw materials, and trade in food.

Trade and Luxuries. The demand for luxuries has had great influence in promoting trade among growing societies. Men usually succeed in wresting the bare necessaries of life from their surroundings, even where these might well seem,

like the frozen Arctic Sea, or the waterless, shadeless, lifeless African desert, to render the attempt hopeless. There is, indeed, no choice in the matter. If they cannot succeed, they must migrate or perish. There is, however, a limit to what human ingenuity can achieve. It may force the tundra to supply food and clothing, but it cannot, for example, compel it to bear tobacco. If its nomad tribes desire tobacco, the only way in which they can obtain it is by trade. Now almost all tribes do early show a great desire for those luxuries which their surroundings do not produce. Next to iron, which is eagerly sought after in the form of hoop iron, knives or fire-arms, alcohol is the article for which uncivilized tribes are most ready to trade. Tobacco has spread over almost the whole world. Tea is another luxury which forms an important article of trade. It is in growing demand all over the continent of Asia, especially among the steppe dwellers. Bright coloured beads, an example of luxury applied to dress instead of to food, form almost a sort of money in many parts of Africa. Nor will any beads do. They must be the particular colour which is fashionable for the time being in a particular locality.

This craving for luxuries is no new thing. Three thousand years ago, King Solomon sent his fleets out every three years for "gold and silver, ivory, apes and peacocks"—a list which contains not a single necessity of life. The oldest European trade was largely in jade, amber, furs, gold, and precious stones. In the middle ages, the demand for spices was one of the great incentives to trade. Cattle could with difficulty be kept through the winter, for root crops were not then known as winter food for stock. Our ancestors' winter fare consisted chiefly of dried and salted meat, which was rendered much more palatable by the use of spices. This gave rise to an extensive caravan trade with Asia, which was not confined to spices, but included many other costly Oriental products. When the Ottoman conquests of the fifteenth century closed the overland route to the East, the search for a sea route by the West led to the discovery of the Cape route to India and of the supposed El Dorado, the land of gold, in the New World. For two centuries, the thirst for gold was inexhaustible. It led to the steady growth of trade with America, and to the discovery of many natural products really of far greater value.

At the present time, the luxuries in demand among civilized men are almost innumerable. They range from such articles as sugar and other tropical produce, which are not necessaries, though we generally think of them as such, to costly furs, fabrics, and precious stones, which only the very wealthy can obtain.

Trade in Raw Materials. The trade in raw materials develops with the growth of manufactures. Three thousand years ago the Levant traded with Spain and Britain for metals. Spain exported wool to Rome two thousand years ago. Our own country exported wool long before it manufactured it. As trade grew and new lands were discovered, more raw material became available. America exported cotton for Lancashire to manufacture. Australia added wool, for Britain had then long devoted itself to manufacturing instead of exporting wool. Almost every country in the world now disposes of some kind of raw produce to the various manufacturing nations of the world.

Trade in Food. The trade in food does not become important till population has grown too dense for the agricultural resources of a country. This happened to ancient Rome, which depended, at the time of its greatest power, almost entirely on imported food. In the middle ages, when all Europe professed Roman Catholicism, fish formed an important article of trade, in consequence of the numerous fast days, on which the eating of meat was forbidden. It is still so in Roman and Greek Church countries. At the present day, most European nations are unable to produce enough food to support their rapidly growing population. Our own country and Belgium are typical examples. Both are rich in minerals. In both, a very dense manufacturing population is gathered into a country of small area. It is difficult at present to raise enough food to feed so many millions on the soil available for cultivation. Wheat is therefore imported in large quantities from the thinly settled wheat-growing lands of the world. Live cattle are brought from America and from thinly settled colonies like those of Australasia. Dead meat is obtained from the same countries, preserved by freezing processes in ships fitted with special chambers. In return, manufactured goods are exported. Germany and most other nations depend, though in a less degree, on imported food. France could

PREPARING MUTTON FOR EXPORT.

almost supply her population, except with tropical produce. Russia, Hungary, and the Balkan States, alone among European nations, grow more food than they can consume.

Speculative Trade. Trade does not end with the satisfaction of particular needs, whether for luxuries, raw material, or food. Many commodities are imported to be re-exported at a profit. The warehouses of trading nations receive wares from all countries and redistribute them to all parts of the world. The same articles figure both among exports and imports. Thus London, for example, has come to be one of the great central markets of the world. It was trade of this sort which enriched the great trading cities of the Middle Ages, shortly to be mentioned.

Transport. The rate at which trade grows depends very largely on the ease or difficulty of transport. It develops quickly between two tribes living at different points on the bank of a navigable river; very slowly between those separated by mountain barriers. Thus, even at the present day, there is very little direct overland trade between India and China, which are separated by the loftiest mountain ranges in the world.

Transport is carried on either by land or water. Transport by land is carried on by road, and, much later, by rail. In transport by road goods are carried either by human porters or by beasts of burden or draught. In transport by rail a draught engine is driven by mechanical power.

Transport by Road. Human labour is employed where domestic animals are not used. Women are the oldest beasts of burden in the world, and still do most of the carrying among savage tribes. In some parts of Africa, animals cannot be used owing to the prevalence of the tse-tse fly, whose bite is fatal to cattle and horses. Native porters are therefore employed instead. In South America, which has few domestic animals, Indian labour is similarly employed.

Sometimes the nature of the country makes the use of draught or baggage animals difficult. This is so in the tropical forests, where the paths are narrow trails between walls of luxuriant forest, which is constantly tending to destroy the path. A similar difficulty prevents the use of animal labour in mountainous or difficult country like the interior of Madagascar.

The slave trade, as it existed till recently in Africa, was one

LADEN YAKS IN TIBET.

consequence of the impossibility of using beasts of burden. Ivory and other produce of the interior are still carried by porters, who, on reaching the markets in former days, would have been sold together with the goods they carried. This may be the most economical plan under the special circumstances, but, as a rule, whenever human carriage is hired, it is a very expensive method. It is also very slow, the strength and speed of men being much inferior to those of animals.

The beasts of burden and draught used in different parts of the world vary with climate and other conditions. The most northerly is the dog, used by the Eskimo. As it can live wholly on animal food, it can be employed farther north than the reindeer, which depends on a supply of reindeer moss. The reindeer is the chief draught and baggage animal on the tundra, where its food is abundant. The horse is invaluable in temperate climates. It is chiefly used for draught. It has been introduced by Europeans wherever the climate is suitable, as on the grassy plains of North and South America and Australia. It is replaced by the ass and mule in hotter and drier regions. In the desert the camel is the only suitable beast of burden. It can go long distances without food or water, and can bear the scorching sun. Oxen are used as draught animals in South Africa and in many parts of Europe, Asia, and America. Two animals are suitable as beasts of burden for high mountain passes. The llama, belonging to the camel family, which is employed in the Andes, and the yak in Tibet. Neither descends much below the snow line.

Before the introduction of steam much of the trade of the world was carried on by caravans of human carriers or beasts of burden. The caravan routes crossed Asia and Africa, bringing their produce to the trading towns of the Mediterranean. Caravan traffic still goes on where railways have not yet been constructed, but, as these extend, it will steadily diminish. Carriage by means of animals is neither so slow nor so costly as human carriage, but it is still unsuitable for very perishable merchandise.

Transport by Rail was introduced about 1830. Permanent roads are made of steel rails, and steam is employed as motive power. All European countries are now covered by a network of railways, unless the nature of the country makes this impossible, as in parts of Norway. Great lines are built from ocean

to ocean, like the Canadian Pacific Railway, connecting Montreal and other Atlantic ports with Vancouver, on the Pacific. The still longer Trans-Siberian railway, now double-tracked, together with the great European lines, connects the two oceans across Europe and Asia. Railways are carried up the Andes to a height of over 15,000 feet, and a Trans-Andean railway will be completed early in the twentieth century. Tunnels have been cut through great mountain ranges like the Alps, which are pierced by the Mont Cenis and Simplon tunnels, connecting the valleys of the Rhone and Po, and the St. Gotthard, connecting the Rhine and Po. The effect has been greatly to facilitate trade between northern and southern Europe. A railway has even been made across the Egyptian desert, which now brings the interior of Africa into easy communication with the Mediterranean and thus with Europe.

Transport by rail is costly but rapid. The advantage of quick transit frequently compensates for the higher rates, especially in the cases of perishable goods and of valuable articles of little bulk.

Transport by Water is carried on by river, canal, lake, and sea. The boat or ship corresponds to the beast of burden or the locomotive. It is the cheapest form of transport, as no roads have to be made, and very bulky and heavy goods can be carried. Steam power is more costly than wind power, but shortens the time of transport, which is the first consideration with goods of a perishable nature.

Rivers are natural roads, connecting the coast with the heart of a country. By following them, communication is made comparatively easy. Riverine tribes usually carry on a considerable trade up and down the river. The Congo, Niger, Zambesi, and Nile are natural trading highways for the interior of Africa. The Brazilian forest is intersected by the Amazon and its tributaries, along which a brisk trade in forest produce is carried on.

Rivers increase in importance as countries become more thickly settled and manufactures grow. The great rivers of Europe — the Rhone, Rhine, Elbe, Oder, Vistula, Danube, Dnieper, Don, and Volga—have for centuries been channels along which much of its trade has flowed. Great trading cities have arisen at their mouths and on their banks.

The St. Lawrence and its system of lakes and canals form a trade route from west to east across the North American continent. It collects the wheat and meat of the prairies; the furs, fish, and timber of the Canadian forest; and the dairy produce and manufactured goods of Ontario. Montreal is therefore another important trading centre which owes its prosperity to its excellent water communication with a large and rich district.

CANADIAN RIVER STEAMER.

A river, to be of the greatest value for trade, must be free from falls and rapids. The centre of Africa is a plateau, and most of the great African rivers, *e.g.*, the Congo, Nile, and Zambesi, form rapids where they fall over the edge of the plateau to the coastal plain. This makes them of little use as a means of communication between the coast and the interior, and much impeded the opening up of Africa, although above the falls a brisk trade has been long carried on up and down stream.

In the second place, a river must be ice-free all the year. The St. Lawrence is unfortunately ice-bound in winter, and during that season much trade is diverted to the ports of Halifax in Nova Scotia, and St. John in New Brunswick, which are open all the year. The great rivers of Siberia are not only ice-bound for many months, but they flow into an ice-bound sea. Siberia has therefore no good ports, and most of the trade is carried on by land, always a more costly process.

Great inconvenience is experienced when the ice-bound river is almost the only means of penetrating into a country, as in the case of the Yukon. Passengers for Klondike, whether going up stream from the coast or down stream after crossing the Chilcoot Pass, must wait till the ice breaks up in spring, and the difficulty of transport raises the price of all the necessaries of life to many times the ordinary price.

A third hindrance to the commercial usefulness of rivers is the formation of bars or deltas at their mouths. These are caused by the sediment which a river brings down with it. The Mersey, Thames, Seine, Loire, and Gironde would become choked by bars but for constant dredging, and thus the ports of Liverpool, London, Rouen, Nantes, and Bordeaux would be ruined. The Rhone, which on the map appears to be such an excellent natural waterway for Southern France, is not navigable at its mouth It has a large delta, and bars are constantly formed at the mouth of its distributaries. Aigues Mortes, once the port, is silted up, and the same fate has overtaken St. Louis, an artificially formed port. Marseilles, the chief port for the Rhone valley, is not at the mouth of the river at all, but farther east. The Mississippi, another river which would quickly silt up the distributaries across its large delta, has been compelled by skilful engineering to scour out its bed. Where such difficulties cannot be overcome, prosperous ports decline, as Aigues Mortes did, and trade finds some other outlet.

Rivers are utilized for trade in two ways. In forests their currents are used to float down timber. On the Rhine it is a common sight to see huge rafts of timber being floated or towed down. In Norway, not merely timber, but barrels of tar are transported in the same way. On the Yang-tse-kiang, in China, logs are floated down in January, and take about six months to travel 600 miles. The clearing of the Canadian forest has been greatly helped by the network of rivers which carried away the timber as fast as it was cut. In Brazil the mahogany cut in the forests is dragged by teams of oxen, or carried on the shoulders of Indian porters, to the nearest stream and started on its journey to the coast.

Such a primitive method of transport is of course only suited for cargoes like timber, which will not suffer by such rough treatment. For most goods boats are needed. These vary

from the light canoes in which native tribes collect local produce, to the river steamers which ply on most of the navigable rivers of the world. Great ocean liners come into estuary ports like Glasgow, Liverpool, London, Hamburg, Montreal, and many others.

Lakes are frequently connected with rivers, as the Great Lakes of North America with the St. Lawrence. They offer all the advantages of rivers when thus connected with the sea. A number of flourishing ports have sprung up round the Great Lakes, and do a large trade both with the interior and with the coast.

Canals are artificial rivers. They are made for a variety of reasons. One very common one is to deepen the bed of a narrow river like the Clyde, calling a port like Glasgow into existence. A hundred years ago there were but fifteen inches of water at Glasgow at low tide; to-day there are more than as many feet. This improvement has been made at a cost of £10,000,000. The St. Lawrence was deepened to enable ocean steamers to proceed as far as Montreal.

A second reason is to bring an inland town into direct communication with the sea. Bruges, one of the most flourishing trading towns of the Middle Ages, was connected by canal with the port of Sluys. This canal was blocked by the Emperor Maximilian of Germany, and Bruges sank into decay. The Manchester Ship Canal was made at a cost of £15,000,000 to make Manchester a port and save the cost of trans-shipping goods at Liverpool.

A third reason is to shorten long and dangerous voyages. Examples of this are very numerous. The Caledonian Canal avoids the voyage round the north of Scotland. The cutting of a ship canal between the Forth and Clyde would further reduce the distance and greatly benefit the trade of Scotland. The Kiel (Kaiser Wilhelm) Canal, from the mouth of the Elbe to Kiel Bay, was opened a few years ago to avoid the passage round the Skager-Rak and Kattegat. This forced Copenhagen, which formerly charged high dues, to become a free port, in order to lose as little trade as possible. A canal across the isthmus of Corinth saves the voyage round the Morea. The Suez Canal, connecting the Mediterranean and Red Seas, is the greatest achievement of the kind. Before this canal was made, the only route to India was round the Cape of Good

Hope, double the distance. The Panama canal saves the long and dangerous voyage round Cape Horn, and brings the Atlantic and Pacific within a few hours of each other. By it New York is 10,000 miles nearer San Francisco, and 3500 miles nearer Melbourne than by Cape Horn, and the journey from Liverpool to Yokohama, in Japan, has been reduced by 4000 miles.

Inland canals are frequently cut to avoid rapids which interfere with continuous river navigation. The Welland Canal, between Lakes Erie and Ontario, avoids the Falls of Niagara. Proper canals would make the Nile, and other African rivers, navigable from the coast to the interior.

Inland canals are frequently made to improve existing rivers or to provide cheap water carriage where navigable rivers are absent. Many of the English rivers have been canalized and connected with each other by branch canals. The result is greatly to cheapen transport. Barges are towed by horses or steam tugs at small expense, but the process, though cheap, is too slow to be always suitable. Every country, as it becomes more thickly populated, finds it useful to cut canals for cheaply transporting heavy goods, like brick and building stone, which are not of a perishable nature. The system is carried very far in China. North China, in particular, is covered with a network of canals. The Grand Canal, an important means of communication between north and south China, is more than 600 miles long.

The third means of water communication is by sea. The midland seas and archipelagos of the world have long been the scene of busy trade. The Mediterranean, the most favourably situated of all midland seas, has been a highway of trade for several thousand years. The Phœnicians, a Semitic people who founded Tyre and Sidon at its eastern extremity, were the greatest traders and explorers of antiquity. Their colony, Carthage, near the present Tunis, was another flourishing trading centre till its fall in the second century before Christ. The Mediterranean trade was important in the middle ages, but declined somewhat after the conquest of Constantinople by the Turks, and the discovery of the New World and of the sea route to India by the Cape of Good Hope. Since the cutting of the Suez Canal, the Mediterranean is once more on the main highway of the world, and Marseilles, Genoa,

Trieste, and other Mediterranean ports are rapidly rising in importance.

The Baltic does for the trade of northern Europe what the Mediterranean does for southern. Timber, wheat, flax, and iron, form the staple of its export trade. Unfortunately, it is ice-bound in winter, but ice breakers are now being used to overcome this drawback.

Until the end of the 15th century, trade was chiefly carried on by coasting vessels. The discovery of America led to a great development of oceanic trade. This has increased enormously since the introduction of steam shortened the duration of voyages. Regular lines of ocean steamers now cross the Atlantic, Pacific, and Indian Oceans. The products of the whole world can therefore be freely interchanged by trading vessels which take out one cargo and return with another. The varieties of cargo are too numerous to mention.

Ports, especially when situated at the mouth of navigable rivers connecting the coast with the interior, are always busy centres of trade. Many circumstances influence their growth. The region for which they serve as outlets must be rich, either in natural produce like Canada or the Mississippi valley, with the ports of Montreal and New Orleans, or in manufactures, like Lancashire, with the port of Liverpool.

The second advantage is nearness to the producing region. This reduces the cost of exporting goods. Thus, Montreal is more favourably situated for the Canadian trade than Quebec. The same circumstance also reduces the cost of importation, by bringing foreign cargoes farther into the heart of a country and thus enabling them to be sold at a smaller cost.

The prosperity of a port may be seriously affected by changes in the mode of transport. A port which could be reached by small vessels may not be able to admit large cargo steamers. Trade moves away, at least for a time. Thus, Le Havre tends to displace Rouen; Saint Nazaire, Nantes; and Pauillac, Bordeaux. The balance is often restored by proper engineering works, and then the advantage of greater proximity to the producing region makes itself felt again in favour of the more inland town. This is the case with Rouen, which, in its turn, is affecting the trade of Le Havre.

A few of the great countries of the world are much hindered by the want of good ports. The Russian ports in Northern

Europe are on the White and Baltic Seas, both ice-bound in winter. Those of Southern Russia are on the Black and Caspian Seas, the latter land-locked. The Siberian ports are ice-bound in winter. The need for an ice-free port for Siberia was one of the great reasons for Russian expansion in Asia. Several fine ports on the Liao-tung peninsula, *e.g.* Dairen and Port Arthur, are quite ice-free; but their acquisition by Russia only provoked Japan to declare war, and to seize them for herself.

Trade Routes and Trading Towns. Until four hundred years ago European trade was confined to the exchange of commodities between Europe, Asia, and Northern Africa. Local trade was no doubt busy among the natives of North and South America, Southern and Central Africa, and the Pacific Islands, but it made no impression on that of the civilized nations of the Old World. The important trade centres were those which were favourably situated for the trade between the three adjacent Old World continents.

Tyre and Sidon early rose to the front rank. Their position made them suitable centres for receiving the Asiatic wares brought by caravans from the Far East through Bagdad, and those brought from the interior of Africa to the Nile. The Mediterranean formed a natural highway for collecting the produce of Southern Europe, and the Strait of Gibraltar opened the route to the North Sea and Baltic. Carthage, with very similar advantages, made a similar use of them, but naturally gave more attention to the African than the Asiatic trade. In the Middle Ages, Venice succeeded to the same advantages. Her position enabled her to collect the produce of Southern and Central Europe, in which she did a large coasting trade. Her ships went to the Levant for Oriental produce, and to Alexandria for that of Africa. Like her predecessors, she passed beyond the Strait and sent her traders to the ports of the North Sea and Baltic. There the countries were more thickly settled, and the Netherlands were then the great manufacturing district of Europe. Important ports therefore developed in Northern Europe. Hamburg and Lübeck collected the produce of Russia and the Baltic; Bruges, that of North West Europe, including the towns of the Netherlands. Meanwhile, an overland trade developed, leading to the rapid growth of towns favourably situated on the

routes connecting the northern trading centres with Venice and her rival, Genoa. Most of them were connected with the Danube and Rhine, the natural routes along which the trade of Central Europe flowed. Augsburg was important, whether the route went by Regensburg (Ratisbon), Vienna, and the Danube to Russia; or by Nürnberg (Nuremberg) and the Elbe to Lübeck and Hamburg; or by Ulm and the Upper Danube to Basel and thence by the Rhine to Bruges. The Netherlands being the chief manufacturing centre, the Rhine route was the most important of the three, and Basel, Mainz, Köln (Cologne) and other Rhine towns grew rapidly.

In Asia, Bagdad was central for caravans trading either with the Mediterranean ports, or with Black Sea ports like Trebizond. Damascus focussed the trade of Syria, Persia, and the surrounding countries.

The Nile, with Cairo and Alexandria, was the chief outlet for Africa.

The discovery of the rich New World led to the rise of the ports of Western Europe, which were nearer to America. Antwerp, which had risen after the decay of Bruges, Bristol, Liverpool, and, at a later date, Glasgow, all became flourishing.

As European colonists spread across America in the nineteenth century, ports and towns developed on the Pacific coast, creating a busy trans-Pacific trade with Eastern Asia. The opening of treaty ports in China greatly stimulated the commerce of that country and of all countries trading with it. The establishment of every new colony, the development of every new manufacture, and every political change calls new trading centres into existence. One of the most recent is Manila in the Philippine Islands, which until recently was avoided by most trading vessels because of the enormous Spanish custom-house charges; since it became a possession of the United States of America, it has become a port of call for many lines of steamers. Owing to the great wealth of tropical produce which the Philippine group does or could cultivate, its trade will grow rapidly.

A PROSPEROUS LAPP SETTLEMENT.

CHAPTER XII.

DISTRIBUTION AND MOVEMENTS OF POPULATION.

Occupations and Density of Population. The distribution and density of population are closely connected with the nature of the occupation. We have already seen how occupations are distributed.

Over the tundra roam poverty-stricken tribes, living on the produce of their reindeer herds and summer fishing, eked out near the borders of the forest by the hunting of fur animals. Equally poor tribes inhabit many parts of the tropical forest, the poorer steppes of Africa and Australia, and the barren shores of Tierra del Fuego.

The steppes support more prosperous races. Their herdsmen are rich in flocks and herds which, together with the products of their domestic industries, enable them to engage in profitable trade. Where the steppe passes into desert, life becomes harder. The camel or caravan driver of the Sahara depends chiefly on trade and plunder. His herds are represented by his string of camels.

On the savanas agriculture has developed, especially in Africa. Near the tropics its progress has not been very rapid owing to the great fertility of the soil and the ease with which a little labour supplies a living. Where conditions are less favourable, it improves rapidly. It has reached a very high level in the rice-growing lands of Eastern Asia and in the temperate forest clearings.

Density of Population among Hunting Tribes. A hunting tribe of very small size soon exhausts the game of a large district. It must have room to wander freely from place to place as game becomes scarce in this or that locality. Thus a very large amount of land is needed to support a very small number of persons in a very poor manner. Hunting is therefore the least economical way of using land.

Hunters are always thinly scattered. The population of the tundra is very sparse, and large tracts are quite uninhabited. The tropical forests are also very thinly peopled. The native tribes of Australia are fast disappearing altogether. In the Highlands of Scotland, where large tracts of pasture land have been turned into grouse moors and deer "forests," the population is now much thinner than when the more economical occupation of pasturage was carried on.

Density of Population among Pastoral Races. Pastoral life, the chief occupation on the grass lands, also requires a large amount of free land, for the flocks and herds are constantly eating different localities bare. It is, however, much more economical than hunting. The herds support a larger population in much greater comfort. As the steppe becomes poorer, the animals require to be fed over a larger area, or their number must be reduced. In either case, the same area supports fewer persons. Thus, the density of population diminishes until, in the desert, it is but one person to several hundreds of square miles.

Mountains are usually more suitable for pasturage than for agriculture. Consequently, the mountainous parts of a country are not very thickly populated. The bleaker the mountains, the thinner the population. The Highlands of Scotland, the most mountainous part of the British Islands, are also the least populous.

Density of Population among Agricultural Races. After the introduction of agriculture the density of population increases very rapidly. Most tropical plants yield a very abundant return. Six bread-fruit trees will keep a family. A month's labour provides a Malay with more sago than he can use in a year. A grove of bananas or coco-nuts means a permanent and abundant supply of food. All of these occupy but a small space, and many clumps and groves, representing many prosperous villages, can be planted on the space within which a mere handful of hunters would starve. Agriculture is therefore a most economical method of using land.

Of all agricultural crops rice is perhaps the most prolific, yielding a hundred fold. The rice-growing lands are therefore densely populated. The population of India is 185, that of China 200, and that of Japan 275 persons to the square mile.

The agricultural lands of the world fall into two classes: long-settled lands which combine manufactures and trade with agriculture, like our own country and the greater part of Europe and Eastern Asia; and newly settled lands which devote themselves chiefly to agriculture, like the arable lands of Siberia, North and South America, and Australia. The latter, which may be called the wheat lands, are still very thinly peopled and export their surplus food. The others, the coal lands, are becoming more and more industrial. They have very dense populations, supported only in part on the agricultural produce of their own country, and mainly on imported food exchanged for manufactured goods. These lands really subsist on their mineral wealth applied to industry. The population of manufacturing centres becomes enormous. The population of the West Riding of Yorkshire is over 3 millions, that of the South Lancashire region is about 4 millions, and that of London over 7 millions. The fact that there are always persons out of work shows that industrial populations, like all others, ultimately outgrow the number which a given area will support.

Distribution of Population in the British Isles. The most thinly populated counties are the moor and mountain ones, where only poor pasturage is available. Sutherland has under 10 persons to the square mile. Inverness has 20 and Argyle 20. The average in these counties is made lower by the grouse moors and deer "forests." Radnorshire, a Welsh mountain county, has 48 persons per square mile. Westmoreland, with better pasture, has 80. The richer pastures of Shropshire and Somerset support 176 and 269 persons to the square mile respectively.

The eastern counties of England are chiefly agricultural. Cambridge has a density of 229 persons to the square mile. Suffolk supports 266, and Berkshire 385.

Where manufactures are carried on, the density of population increases enormously. Cheshire, which combines good pasture with numerous manufactures on the borders of Lancashire, has a density of 930 persons per square mile, the great increase being largely due to the manufacturing element. Warwickshire, which combines coal-mining and manufactures with agriculture, has a density of 1315. The West Riding of Yorkshire supports 1420 persons per square mile, against 370 and

A HARD STRUGGLE FOR EXISTENCE.

200 in the East and North Ridings. Durham has 1350, Lancashire, 2870, Middlesex, 4855, and London itself nearly 39,000 persons per square mile. Lanark, the chief manufacturing county of Scotland, has 1647 persons to the square mile.

Of the four countries which make up the United Kingdom, the most thinly populated is Scotland, which has 201 persons to the square mile. The average is raised by the manufacturing districts of the south. Ireland, with much superior pasture, but few great manufacturing towns, has 135 persons to the square mile. Much of Wales is poor mountain pasture, but it has a relatively large area of thickly-peopled coalfields and manufacturing districts. Its density is 271. England, with large coalfields and manufacturing centres, and with relatively little poor mountain pasture, rises to a density of 668, $3\frac{1}{4}$ times that of Scotland, 5 times that of Ireland, and more than $2\frac{1}{2}$ times that of Wales.

Distribution of Population in Europe. Norway, with its vast stretches of tundra, mountain and forest, is the most thinly peopled country of Europe, having a density of only 19 to the square mile. Sweden, with more arable land and less forest and mountain, has 33 to the square mile. Russia, with extensive tundra and steppe lands, but including Poland, had 75 in 1915,—71 without Poland. The old empire of Austria-Hungary, with rich wheat lands and growing manufactures, had a density of 171. Switzerland, notwithstanding its large area of uninhabited mountain, owes to its manufactures a density of 235 per square mile. The German Empire, combining agriculture and manufactures, had 237, and Belgium, which has 670,—practically the same as England—is almost exclusively industrial.

Occupations and the Expansion of Population. It is sometimes said that societies develop out of the hunting into the pastoral stage, and out of the pastoral into the agricultural stage. This would be true if the same conditions of soil and climate were found in every part of the world, so that any occupation could be carried on anywhere. Then, no doubt, all hunting and fishing tribes would advance to the domestication of animals when their numbers outgrew the resources of the chase, and from this to agriculture when their flocks and herds increased beyond the number which their pastures could support. As agriculture improved, a further increase

would become possible, and when this became too great, industrial centres might in turn develop to relieve the growing congestion.

This, however, is far from being the actual state of the case. Many parts of the world, like the tundra or the desert, are fitted neither for agriculture nor pasture. So far as we can see, the tundra will long remain a thinly peopled hunting-ground. Much steppe land is equally unfitted for agriculture, though well suited for pasture. The far western prairies of North America, and the drier Asiatic steppes, seem destined to remain pastoral lands, while the desert must for the present continue uninhabited. In most cases a race has but a limited choice of occupations. The inhabitants of the tundra or of the drier steppes cannot become agricultural at will. A coalless country cannot become industrial unless it can import coal cheaply, or use some other form of power. Only the rich tropical forests and savanas, and the moister steppe lands and the temperate forests allow their inhabitants to meet their growing needs by exchanging an occupation which supports but a limited number for one which puts their land to a more economical use.

Different societies, therefore, are obliged to act in different ways when their numbers outgrow their existing resources.

Expansion among Hunting Tribes. Hunting tribes cannot in most cases adopt a different mode of life. Their country is often unfitted either for pasture or agriculture. The tropical forest tribes might, indeed, become tillers of the soil, but the Ostyaks or Fuegians have no such choice. Neither can they migrate. They have no beasts of burden; they are not accustomed to act together; and they are surrounded by settled and, therefore, more numerous tribes, or by other hunters with whom they are at constant variance. They are, therefore, generally anxious to keep down their numbers, and infanticide, cannibalism, and the neglect of the sick and aged, are very common. They rarely increase beyond a certain point, and when this is reached, famine and war generally reduce their numbers to those which the hunting grounds can support.

Expansion among Pastoral Races. The nature of the steppe determines the mode in which pastoral societies remedy overpopulation. If it is suitable for agriculture, they may become agricultural, as the Turcomans are doing under Russian in-

fluence. European colonization has transformed the steppes of North America, Australia, and, in part, the savanas of South America, into wheat-growing lands.

If the steppes are too dry for agriculture, then the growing hordes of pastoral invaders can expand only by falling upon their settled neighbours. Their free open-air existence and their life-long habit of rapid movement make them foes to be dreaded. History is full of attempts of pastoral peoples to provide for their surplus numbers in this way. China has been seized by conquerors from the steppes. Other hordes swept over Asia and Europe, and still hold European Turkey. The Arabs have seized the fertile Sudan. The raids of the Scottish Highlanders on the Lowlands, and the forays of Border Moss-troopers are examples in our own history. The bitter struggle going on at the present time between pastoral Kurds and settled Armenians is the most modern instance of all.

Expansion among Agricultural Races. An agricultural society has many remedies against over-population.

It may adopt a prolific and economical crop like rice. This method has been adopted in Eastern Asia.

It may improve its methods by the use of better machinery, fertilizers, and economical methods, like mixed farming. This has been done in most agricultural countries of Europe and the older States of America.

It may utilize its mineral resources and obtain its food from other countries by trade. This has been done by Britain, Belgium, the Eastern United States, and most coal producing countries of Europe.

All these methods meet the difficulty for a time, but in the end migration becomes necessary. It usually begins long before this point is reached,—as soon as it is seen that new countries offer a better chance of getting on.

Migration or the Movement of Peoples. Hunters cannot easily migrate for the reasons already given.

Pastoral races migrate without difficulty. Their migrations usually take the form of invasion. Migration is their daily mode of life; invasion is but the same thing on a larger scale. On wide steppe lands they are horsemen from infancy, and their charges are hard to resist. The onslaughts of the Tatars, the Turks, and the Arabs are proverbial.

Another group which migrates readily, is the surplus population of a maritime fishing community. They, too, are accustomed to constant migration in their daily life, and the boat is to them what the horse is to steppe herdsmen. When such societies become over-populated, they tend to become agricultural, but the more adventurous seek their fortune abroad, becoming pirates, sea kings, or colonists according to circumstances. The descents of the Norsemen during the first thousand years of this era harried our own country and the northern shores of Europe. The Norman invasion and conquest of England showed the old instinct was still alive in these descendants of the Vikings. The same spirit is strong in their descendants, our countrymen of to-day, who emigrate more readily than any other nation.

Agricultural and industrial peoples sometimes migrate in groups when the same cause affects large bodies of men. The migration of the agricultural Pilgrim Fathers, of the industrial Flemish weavers, and of the French Huguenots, were group migrations caused by the religious persecutions of the sixteenth and seventeenth centuries. Except for occasional group migrations, due to outbreaks of the same intolerance, modern emigration is almost without exception a migration of individuals anxious to better themselves. It is rendered very easy by modern facilities of transport.

Limits to Migration. The New World and Australia, neither thickly populated at the time of their discovery, first provided for the expansion of Europe. In the forty-two years, 1853-94, nearly eight million people emigrated from the British Isles alone, one-tenth of whom crossed to British possessions on the other side of the Atlantic, one-sixth went to Australasia, and two-thirds became inhabitants of the United States of America. In America, the East was colonized first, and became over-populated in its turn. Then population moved west, pressed in that direction by the expansion of eastern America as well as by that of Europe. The wave of colonization has now reached the Pacific, but much of the land is very thinly settled. Australia has been colonized chiefly by our own countrymen. Africa was colonized to a small extent in the sixteenth and following centuries, then towards the end of last century became a prize for which Europe scrambled. All the districts suitable for permanent white settlement were appropriated,

and where the climate prevented this, spheres of influence, valuable mainly for the sake of their economic productions, were defined.

Asia seems likely to share the same fate. Britain has held India for 150 years, and has now spread over Burma. France is in Tongking, Holland in the East Indies, and the United States in the Philippines.

There is now little available space for farther migration. The world, as a whole, however, is not overcrowded, though parts of it are. Many vast regions are supporting only a small fraction of their maximum population. The possibilities of Canada and Siberia are only beginning to appear. New food lands might be created by the clearing and cultivation of the tropical forests, and the irrigation of the deserts. Population will not have reached its limit till every square acre has been utilized to the utmost. The day, if it is ever destined to dawn, when this will be inadequate, is still, happily, far distant.

CHAPTER XIII

GOVERNMENT.

Government among Hunting Tribes. Among most hunting tribes, every man is his neighbour's enemy—a competitor for the little game that exists. Where game is more abundant, hunters sometimes combine to kill the larger beasts and share the spoil. All over the area occupied by hunting peoples there is little political organization. Even in tropical lands, where a little cultivation is carried on, they are rarely grouped except in small tribes.

The constant feuds, between both individuals and tribes, make the power of the chief very despotic. It is generally exercised in a cruel and arbitrary manner, and the obedience of the subjects is based on fear. The chief is frequently overthrown by a stronger rival, who abuses his power in much the same way.

Government among Pastoral Races. Pastoral races must combine to tend their flocks and herds and protect them against the forays of other wandering bands. They are grouped in great families, consisting of several generations, descendants and kinsmen of the head of the family.

In a pastoral society, whose prosperity depends on the proper management of herds and pastures, the most valuable man is the most experienced man, that is the aged patriarch. He is obeyed from prudence, because his warnings and advice are too valuable to be disregarded. His authority is absolute, for he has no rivals except younger and, therefore, less experienced members of his own family. Each patriarch is a little monarch.

The central government is of the same patriarchal type. The Tsar of Russia was spoken of by the peasants as the "Little Father." As such he was naturally absolute. The Sultans of Turkey, the Shahs of Persia, the Emperors of China,

representatives of the pastoral Mongolian conquerors, have been absolute monarchs for the same reason. The Highland chiefs were petty kings till after the rebellion of 1745.

Pastoral peoples, with whom may be included desert dwellers, are more responsive to personal leadership than to the fascination of institutions. A Tsar, Sultan, Shah, Mahomet, Madhi, or Bonnie Prince Charlie, secures devoted allegiance, while officialism and codes of law fail to awaken enthusiasm because they correspond to nothing in the daily experience. This makes it very difficult for the West to govern the East, or to sympathize with its political ideas.

Government among Fishing Races.—The habit of prompt obedience to the skipper, learned by every crew, implants in fishing races an instinctive respect for legitimate and reasonable authority. At the same time, there is a marked tendency to equality. Boats being small, skippers are very numerous, and each is the equal of the others. The same tendency is felt in the family, where the frequent absence of the father makes the mother's authority equal to that of the father. Thus, two opposing tendencies combine to influence the form of government. The habit of obedience makes authority respected, but the division of authority prevents it from becoming despotic. Fishing races generally adopt a form of government intermediate between despotism and laxity, that is to say, of the type of a limited monarchy. The society is a society of peers, or equals, governed by one in the interests of all.

Government among Agricultural Races.—Agricultural peoples are rarely fighters, except when attacked. War means the missing of a seed time or harvest. In either case, it is a calamity. The absence of a fighting class prevents the growth of a despotic chief, and cultivation in common is a very general form of organization. Many traces of such village communities, holding and cultivating land in common, remain in our own country. Of these the "commons" of so many towns and villages are the most familiar.

Agricultural societies, however, are very liable to attack, partly because of their prosperity, partly because they are unwarlike and easily vanquished. Pastoral invaders descend from the steppes, or mountains; or fishing invaders, like the Danes, land on the coasts. After conquest the victorious leader frequently distributes the best land among his followers,

on condition that they assist him in case of need. This develops into feudalism, or the tenure of land for military service.

In a feudal society, land is in the hands of a small number of military peers who easily keep in check the peaceful tillers of the soil, from whom forced labour is generally extorted. Their power procures them an important share in the government, especially when notions of equality are inherited from fishing ancestry. This explains the importance of the House of Peers in our own country, and the repeated struggles between king and barons. The power of the nobility, or landed aristocracy, is still very great in many European countries, *e.g.* Spain and Germany.

An interesting example of a feudal society was found on the Upper Zambesi. The Borotsi, an invading tribe from the south, reduced some twenty or thirty other tribes to subjection. All land belonged to the king, who also claimed a tribute of cattle, grain, tools, weapons, etc. Of these he kept what he chose, distributing the surplus among his vassal chiefs. The Borotsi formed the military aristocracy. The subject tribes were compelled to labour for them when required without payment. One child from each subject family might be enslaved, an interesting parallel to serfdom in Europe.

As population increases, and trade and manufactures develop, a wealthy middle class arises and, in its turn, claims a share of political power. This is represented by the House of Commons in our own country, and by the lower legislative house of other countries with popular forms of government.

After this stage is reached, government by a hereditary monarch readily passes into government by an elected monarch; that is into a Republic. Fishing races naturally incline to hereditary monarchy, because they are accustomed to a son inheriting his father's boat. Feudal societies also find it natural because land can be handed on in the same way. But individual talent, by which a man rises in a commercial society, is not hereditary, and therefore this mode of succession is less sacred in a commercial society. In the United States, where the aristocracy has long been commercial rather than landed, a Republican form of government prevails. Even in our country, the title of the reigning house is a Parliamentary and not a hereditary one, and some hundreds of persons have a better claim by blood than Queen Victoria.

Summary. Broadly speaking we may say that, in lands occupied by hunting tribes, government is despotic but not firmly established.

On the grass lands, government is despotic and firmly established, the ruler being regarded as the head patriarch.

Among fishing races, government is limited but firmly established.

An agricultural society passes through a stage of common cultivation into feudalism, where the power is in the hands of a fighting, land-holding class, the peers of each other, whose power acts as a check on that of the king. If the conquering race be of pastoral origin, as it was in China, the royal authority may assume a more despotic form.

The last stage is reached when trade develops, allowing a man to rise by his own exertions. Such a society regards personal ability as more important than descent, and readily adopts Republican government.

Allowance must be made for the influence of reaction and imitation. A race revolting from despotic government frequently adopts Republican institutions before passing through the capitalistic stage, as Cuba has recently done. In the same way, the United States has served as a model for the South American Republics.

CHAPTER XIV.

THE RACES OF MEN.

Race. In the preceding chapters we have studied the distribution of man and his activities from a geographical point of view, noting the effect of his surroundings on his occupations and organization. Tundra, forest, steppe, savana, and desert, however, though they show us characteristic types of society, do not give us those natural divisions of men according to their physical peculiarities, which we are accustomed to speak of as the races of mankind.

Colour and Race. The most striking difference among different groups of men is the colour of the skin, which is white in most Europeans and in many Asiatics and Africans, black in the natives of tropical Africa, yellow in Eastern Asia and the adjoining islands, brown among the Malays, and red in the natives of the New World.

If skin colour is to be taken as the characteristic sign of race, there would seem to be five races—white, black, yellow, brown, and red. This classification is frequently adopted. There is, however, some reason for thinking that the brown and the red are really branches of the yellow, thus reducing the number to three. Others again attach little importance to skin colour, and distinguish many different races.

The Three Races. In the present state of our knowledge, skin colour seems certainly the simplest, if not the most useful, mode of classification. We shall therefore divide man into three groups—the Black; the Yellow, including the Red and Brown; and the White. The Black is often called the Negroid, the Yellow the Mongolic, and the White the Caucasic.

Physical Characteristics of the Three Races. A variety of other physical characteristics combine with colour to distinguish one race from another. Each of the three races has its special shape of head and skull, its peculiarities of hair-

structure and growth, and more or less constant proportions in the size of different bones and organs.

The Black man has a prominent jaw, thick protruding lips, broad, flat nose, receding forehead, long, narrow skull, and curly woolly hair, which, when magnified, looks like a piece of very narrow thick ribbon.

The Yellow man has more shapely features than the Black. The cheek-bones are prominent, the eyes obliquely set, the skull rounded, the hair straight and lank and appearing round like a thread when magnified.

The White man has an oval face, with eyes set horizontally, a high upright forehead, and shapely features. The skull is neither so elongated as in the Black, nor so rounded as in the Yellow man. The hair is wavy, and, when magnified, is elliptical and not round in section.

Distribution of the Black Race. The Black race is found in Africa, south of the Sahara, where it constitutes almost the entire bulk of the population. It is represented throughout the Malay Archipelago, and appears to include the aborigines of Australia, Tasmania, New Guinea, and Melanesia. Besides these, who may be described by the general name of negroes, we find scattered undersized Black peoples, *e.g.* the Pygmies of the Congo Forest—sometimes termed negrillos—the Andaman Islanders, and the aborigines of the Malay Archipelago and the Philippines—commonly called negritos. Both negrillos and negritos are hunting tribes at a very low state of physical and social development.

The African negroid peoples are divided into the Sudanese —to whom the term negro is generally exclusively applied in common speech—speaking many different languages; and the Bantu peoples of Central and Southern Africa, all speaking closely related languages. The Bushmen and Hottentots of South Africa are taller than the negritos, but in other respects closer to the negrito than to the negro.

Distribution of the Yellow Race. The Yellow race is the predominant race in the north and east of Asia. It may be divided into Northern and Southern Mongolians. The Northern Mongolians are found in the north of the Old World, from Lapland to the southern limits of the great steppe lands. They include the hunting tribes of the tundra, the pastoral peoples of the steppe, and agricultural peoples like the Koreans

and Japanese. The Southern Mongolians include the agricultural Chinese, the Burmans, Tibetans, and the inhabitants of south-eastern Asia generally.

The Malays. For the Malays, who, though sometimes considered as a separate Brown race, are probably of Mongolic origin, Mr. Keane suggests the convenient term Oceanic Mongols. Their skin is browner than that of the typical Mongolian, the nose straighter, and the eyes are less oblique. In other respects they strongly resemble the Mongolians, especially in a peculiar fold of the eyelid, considered as an unmistakable characteristic of that race. The Malays form the bulk of the population in Formosa, the Philippines, Malaysia, the Nikobar islands, and Madagascar. They are at all stages of development, from the primitive hunting tribes of the Malay forest to fairly civilised peoples like the Javanese.

The Polynesians—such as the Maoris of New Zealand, Tongans, Samoans—are finely formed men, superficially resembling the White men. They are probably a race of mixed Mongolian and Melanesian blood.

The Redskins. The native tribes of America are often classed as a separate Red race. The nose is large and often aquiline, the eyes are rarely oblique, and the average height is considerably above that of the Mongolian. The hair, however, is very like that of the Mongolian, both in appearance and growth and under the microscope. Their language is of a type not found elsewhere. Ethnologists, therefore, cannot agree as to their classification. Some regard them as a distinct race; others consider them as immigrants from Asia across Bering Straits; while still others suppose that migration may have been in the opposite direction, from America to Asia, in which case the Red might be the true race, and the Yellow a variety.

There are well-marked differences between the Redskins in North, Central, and South America, both in outward appearance and in social development.

Distribution of the White Race. The White race includes the inhabitants of most of Europe, of North Africa, and of South-West Asia. It is divided into the northern group—found from Britain to India—with light hair, long skulls, ruddy complexions and blue eyes; the central group—found in most of the mountain lands from France to Persia—with

brown hair, round skulls, pale or swarthy complexions, and dark eyes; and the southern group—found round the Mediterranean (but also including many Hindus, and even remote tribes, *e.g.* the hairy Ainus of Japan)—with dark hair, long skulls, variable complexion, and black or, less frequently, blue eyes.

White men are often subdivided, according to their languages, into Ayran or Indo-European, Semitic, and Hamitic peoples. These are linguistic, and not racial terms.

Purity of Race. It is often said, and probably with much truth, that there is no such thing as a pure race. From the earliest time migration has been going on, with consequent intermixture. It is often supposed that all the existing differences of mankind have been produced by the intermixture of races that have long since disappeared.

Migration still continues. The negro has been forced to migrate to America in great numbers, and the Chinese and other Yellow men are rapidly migrating across the Pacific, while the Whites have spread all over the globe. A large number of half-breed races have originated through the intermixture which almost invariably follows. Politically, most of the world is under the control of the White man.

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